Rouget Road Solar Farm

Exhibit A-4.5 Summary of Tribal Engagement MPSC Requirements

Lenawee County, Michigan

SEPTEMBER 2026

PREPARED FOR

Rouget Road Solar, LLC
353 N Clark St.
30th Floor
Chicago, IL 60654

PREPARED BY

SWCA Environmental Consultants
200 W 22nd St.
Suite 220
Lombard, IL 60148

Exhibit A-4.5 – Summary of Tribal Engagement

1. **Exhibit A-4.5 – Summary of Tribal Engagement**
   i. **A summary of tribal engagement, including at a minimum, the communication and outreach conducted with each Tribe, date and time, who participated, and a summary of tribal input and outcomes if applicable.**

Table 1 in **Appendix II Exhibit A-4.5** provides a summary of tribal engagement including the name of the federally recognized tribe, contract person, title, date of outreach and response, and summary of tribal input and outcomes. Additionally, a copy of the letter provided to each tribe is included in **Appendix II Exhibit A-4.5.** See also, **Appendix I**, **Exhibit 2**, Direct Testimony of C. Mcknight, at pp. 15 and 18-19.

Rouget Road Solar Farm

Exhibit A-4.5 Summary of Tribal Engagement

Lenawee County, Michigan

Tribe	Point of Contact	Coordination Description	Coordination Outreach Timeline	Status	Necessary Permits/Approvals/Next Steps
Bay Mills Indian Community	Paula Carrick, THPO 12140 West Lakeshore Dr. Brimley, MI 49715 906-248-8759 paulacarrick@baymills.org	Project Consultation Letter	November 2025 - present	**11/20/2025**: SWCA emailed a Project consultation letter to Tribes with an interest in Lenawee County. The letter included recommendations provided by SHPO for content. No response has been received to date	Applicant will continue to consult with the SHPO and THPOs. Comments received will be incorporated into the cultural survey plan, recordation, and design updates as needed. Cultural resources surveys are expected to be completed by Q4 2025/Q1 of 2026 with submittal of findings to SHPO and THPOs, as requested, Q1 of 2026.
Grand Traverse Band of Ottawa & Chippewa Indians	Aaron Chivis, Cultural Department Manager 2605 N. West Bay Shore Dr. Peshawbestown, MI 49862 231-534-7764 Aaron.Chivis@gtb-nsn.gov	Project Consultation Letter	November 2025 - present	**11/20/2025**: SWCA emailed a Project consultation letter to Tribes with an interest in Lenawee County. The letter included recommendations provided by SHPO for content. No response has been received to date	Applicant will continue to consult with the SHPO and THPOs. Comments received will be incorporated into the cultural survey plan, recordation, and design updates as needed. Cultural resources surveys are expected to be completed by Q4 2025/Q1 of 2026 with submittal of findings to SHPO and THPOs, as requested, Q1 of 2026.
Hannahville Indian Community, Michigan (Chairperson)	Dustin Meshigaud, Tribal Historic Preservation Office N14911 Hannahville B-1 Rd. Wilson, MI 49896 906-723-2271 dustin.meshigaud@hannahville.org	Project Consultation Letter	November 2025 - present	**11/20/2025**: SWCA emailed a Project consultation letter to Tribes with an interest in Lenawee County. The letter included recommendations provided by SHPO for content. No response has been received to date	Applicant will continue to consult with the SHPO and THPOs. Comments received will be incorporated into the cultural survey plan, recordation, and design updates as needed. Cultural resources surveys are expected to be completed by Q4 2025/Q1 of 2026 with submittal of findings to SHPO and THPOs, as requested, Q1 of 2026.
Keweenaw Bay Indian Community of the Lake Superior Band of Chippewa Indians	Paul Halverson, THPO 16429 Bear Town Rd. Baraga, MI 49908 906-353-6623 ext. 4178 phalverson@kbic-nsn.gov	Project Consultation Letter	November 2025 - present	**11/20/2025**: SWCA emailed a Project consultation letter to Tribes with an interest in Lenawee County. The letter included recommendations provided by SHPO for content. No response has been received to date	Applicant will continue to consult with the SHPO and THPOs. Comments received will be incorporated into the cultural survey plan, recordation, and design updates as needed. Cultural resources surveys are expected to be completed by Q4 2025/Q1 of 2026 with submittal of findings to SHPO and THPOs, as requested, Q1 of 2026.

Tribe	Point of Contact	Coordination Description	Coordination Outreach Timeline	Status	Necessary Permits/Approvals/Next Steps
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan (THPO Director and Chairman)	Alina Shively, THPO P.O. Box 249, Watersmeet, MI 49969 906-358-0137 alina.shively@lvd-nsn.gov	Project Consultation Letter	November 2025 - present	**11/20/2025**: SWCA emailed a Project consultation letter to Tribes with an interest in Lenawee County. The letter included recommendations provided by SHPO for content. No response has been received to date	Applicant will continue to consult with the SHPO and THPOs. Comments received will be incorporated into the cultural survey plan, recordation, and design updates as needed. Cultural resources surveys are expected to be completed by Q4 2025/Q1 of 2026 with submittal of findings to SHPO and THPOs, as requested, Q1 of 2026.
Little River Band of Ottawa Indians	Corey Wells, THPO 2608 Government Center Dr. Manistee, MI 49660 coreyawells@lrboi-nsn.gov	Project Consultation Letter	November 2025 - present	**11/20/2025**: SWCA emailed a Project consultation letter to Tribes with an interest in Lenawee County. The letter included recommendations provided by SHPO for content. No response has been received to date	Applicant will continue to consult with the SHPO and THPOs. Comments received will be incorporated into the cultural survey plan, recordation, and design updates as needed. Cultural resources surveys are expected to be completed by Q4 2025/Q1 of 2026 with submittal of findings to SHPO and THPOs, as requested, Q1 of 2026.
Little Traverse Bay Bands of Odawa Indians, Michigan (THPO and Chairperson)	Mae Wright, THPO 7500 Odawa Cir. Harbor Springs, MI 49740 231-242-1408 mwright@ltbbodawa-nsn.gov	Project Consultation Letter	November 2025 - present	**11/20/2025**: SWCA emailed a Project consultation letter to Tribes with an interest in Lenawee County. The letter included recommendations provided by SHPO for content. No response has been received to date	Applicant will continue to consult with the SHPO and THPOs. Comments received will be incorporated into the cultural survey plan, recordation, and design updates as needed. Cultural resources surveys are expected to be completed by Q4 2025/Q1 of 2026 with submittal of findings to SHPO and THPOs, as requested, Q1 of 2026.
Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan (THPO and Chairperson)	Lakota Hobia, THPO Gun Lake Tribe, Attn: THPO 2872 Mission Dr. Shelbyville, MI 49344 269-397-1780 Lakota.Hobia@glt-nsn.gov Mbpi_thpo@glt-nsn.gov	Project Consultation Letter	November 2025 - present	**11/20/2025**: SWCA emailed a Project consultation letter to Tribes with an interest in Lenawee County. The letter included recommendations provided by SHPO for content.	Applicant will continue to consult with the SHPO and THPOs. Comments received will be incorporated into the cultural survey plan, recordation, and design updates as needed. Cultural resources surveys are expected to be completed by Q4 2025/Q1 of 2026 with submittal of findings to SHPO and THPOs, as requested, Q1 of 2026.

Tribe	Point of Contact	Coordination Description	Coordination Outreach Timeline	Status	Necessary Permits/Approvals/Next Steps
				01/16/2026: The Tribe responded to the November 2025 letter requesting additional information about the project and how the project would account for previously recorded resources within the project area. **02/12/2026:** SWCA provided project details and requested a coordination meeting to discuss the Tribe's concerns. **02/27/2026:** Scheduling for March Consultation Meeting. **03/09/2026:** Meeting held with the Tribe, the Michigan SHPO, the MPSC, SWCA, and the Applicant to discuss the project. 03/ **03/18/2026:** The Tribe provided input on the survey methodology.	

Tribe	Point of Contact	Coordination Description	Coordination Outreach Timeline	Status	Necessary Permits/Approvals/Next Steps
				03/24/2026: The Tribe provided input on the survey methodology **05/05/2026**: Meeting with Tribe, SHPO, MPSC, SWCA, and Applicant to discuss survey methodology. **05/11/2026**: Meeting held with the Tribe, the Michigan SHPO, the MPSC, SWCA, and the Applicant to discuss survey methodology. **05/14/2026:** The Tribe provided standards for survey methodology. **06/03/2026:** Scheduling occurred for follow-up meeting **06/12/2026**: Consultation meeting held with the Tribe, the Michigan SHPO, the MPSC, SWCA, and the Applicant **06/17/2026:** SWCA provided mapping and further details about the proposed	

Tribe	Point of Contact	Coordination Description	Coordination Outreach Timeline	Status	Necessary Permits/Approvals/Next Steps
				methodology to the Tribe. **07/01/2026:** SWCA provided the Phase I archaeology report to the Tribe for review. **08/19/2026:** SWCA reached out to the Tribe to request an update on their review. **08/28/2026:** The Tribe provided comments on the Phase I Report seeking minor changes to the unanticipated discovery plan but approving of the report's recommendations. **08/31/2026:** SWCA replied to Tribe to ask for clarification regarding avoidance areas	
Nottawaseppi Huron Band of the Potawatomi	Onyleen Zapata, THPO Pine Creek Indian Reservation 1301 T Drive S, Fulton, MI 49052 269-704-8347 Onyleen.Zapata@nhbp-nsn.gov	Project Consultation Letter	November 2025 - present	**11/20/2025**: SWCA emailed a Project consultation letter to Tribes with an interest in Lenawee County. The letter included recommendations provided by SHPO for content. **11/21/2025:** Tribe responded requesting that THPO	Applicant will continue to consult with the SHPO and THPOs. Comments received will be incorporated into the cultural survey plan, recordation, and design updates as needed. Cultural resources surveys are expected to be completed by Q4 2025/Q1 of 2026 with submittal of findings to SHPO and THPOs, as requested, Q1 of 2026.

Tribe	Point of Contact	Coordination Description	Coordination Outreach Timeline	Status	Necessary Permits/Approvals/Next Steps
				Generalist Kennedy Swan be added to all correspondence.	
Pokagon Band of Potawatomi Indians	Matthew J.N. Bussler, THPO Department of Language and Culture 59291 Indian Lake Road/P.O. Box 180, Dowagiac, MI 49047 269-462-4316 Matthew.Bussler@pokagonband-nsn.gov	Project Consultation Letter	November 2025 - present	**11/20/2025**: SWCA emailed a Project consultation letter to Tribes with an interest in Lenawee County. The letter included recommendations provided by SHPO for content. No response has been received to date	Applicant will continue to consult with the SHPO and THPOs. Comments received will be incorporated into the cultural survey plan, recordation, and design updates as needed. Cultural resources surveys are expected to be completed by Q4 2025/Q1 of 2026 with submittal of findings to SHPO and THPOs, as requested, Q1 of 2026.
Saginaw Chippewa Indian Tribe of Michigan	Marcella Hadden, THPO Ziibiwing Center of Anishinabe Culture & Lifeways 6650 East Broadway, Mt. Pleasant, MI 48858 989-775-4751 mlhadden@sagchip.org	Project Consultation Letter	November 2025 - present	**11/20/2025**: SWCA emailed a Project consultation letter to Tribes with an interest in Lenawee County. The letter included recommendations provided by SHPO for content. No response has been received to date	Applicant will continue to consult with the SHPO and THPOs. Comments received will be incorporated into the cultural survey plan, recordation, and design updates as needed. Cultural resources surveys are expected to be completed by Q4 2025/Q1 of 2026 with submittal of findings to SHPO and THPOs, as requested, Q1 of 2026.
Sault Ste. Marie Tribe of Chippewa Indians, Michigan (Cultural Repatriation Specialist and Chairperson)	Emma Donmyer, Repatriation and Historic Preservation Specialist 2 Ice Circle Chi Mukwa, Sault Ste Marie, MI 49783 906-635-6050 ext. 26143 EDonmyer1@saulttribe.net	Project Consultation Letter	November 2025 - present	**11/20/2025**: SWCA emailed a Project consultation letter to Tribes with an interest in Lenawee County. The letter included recommendations provided by SHPO for content. No response has been received to date	Applicant will continue to consult with the SHPO and THPOs. Comments received will be incorporated into the cultural survey plan, recordation, and design updates as needed. Cultural resources surveys are expected to be completed by Q4 2025/Q1 of 2026 with submittal of findings to SHPO and THPOs, as requested, Q1 of 2026.

Summary of Tribal Engagement

Tribal Coordination

- Copy of November 20, 2025 consultation letter sent to all tribes, privileged information redacted as needed. Attachments included

11/20/2025

Dear Tribal Historic Preservation Officer and/or Tribal Cultural Representative,

As part of its responsibilities under Michigan Public Act 233 of 2023 (PA 233), *Renewable Energy and Energy Storage Facility Siting*, the Michigan Public Service Commission (MPSC) is seeking consultation (as required in PA 233 Section 224.1b[1]) and determining the area of potential effects ("APE") for the proposed project. Federally listed sovereign Nations with an interest in the state of Michigan are invited to review and comment on Rouget Road Solar Farm, LLC's (Rouget Road Solar Farm) (a wholly-owned subsidiary of RWE Clean Energy LLC [RWE]) proposed **Rouget Road Solar Farm Project** (the "Project"). The proposed Project will require a state-siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC (PA 233 Section 226.7b). Although Rouget Road Solar Farm requests a review and comment on the Project, the MPSC is the state agency and may be communicated with directly.

Based on Michigan State Historic Preservation Office (MI SHPO) guidance from their *Instructions for the Application for PA 233 Renewable Energy Storage Facility Siting Consultation Form*:

> "**Public Act 233** requires the applicant for energy siting and storage facilities to consider and address impacts *to the environment and natural resources, including, but not limited to, sensitive habitats and waterways, wetlands and floodplains, wildlife corridors, parks,* ***historic and cultural sites****, and threatened or endangered species*. The applicant must submit this information to the Michigan Public Service Commission (MPSC) for consideration in permitting the project. In order to facilitate considerations of historic and cultural sites (hereafter Historic Properties), the MPSC has required applicants to consult with the State Historic Preservation Office (SHPO)."

This letter is part of the early coordination phase of the environmental review process, requesting comments associated with this Project. We are requesting comments from your area of expertise regarding any possible environmental or cultural effects associated with this Project. Please provide any additional information you may have regarding potential cultural resources in the Project area so they may be accounted for during the environmental review of this Project. This information can be provided directly to RWE or the MPSC.

Project Description

The proposed Project is southeast of the city of Adrian, in Palmyra Township, Lenawee County, Michigan (Figure 1). Historic Mapping places the proposed Project area in Sections 7, 8, 9, 15, 16, 17, 20, 21, 22, 27, 28, 29, 30, 33, and 34 of Township 7 South, Range 4 East as seen on the enclosed USGS 7.5 series for Tecumseh South and Palmyra, Michigan Topographic Quadrangle map (Figure 2). Rouget Road Solar Farm is proposing to construct a 175-megawatt (MW) alternating current (AC) solar photovoltaic power generating facility. The leased area/Project area boundary includes approximately 2,142 acres (867 hectares) (Figures 2 and 3). Construction will require 1,513 acres (612 ha) of what is currently primarily agricultural land (see site plan boundary in Figure 1). Limited tree removal is planned across 7.96 acres (3.22 ha). Proposed work required for the Project includes construction of a switchyard, substations, access

[1] Sections refer to those found at: https://www.legislature.mi.gov/documents/2023-2024/publicact/htm/2023-PA-0233.htm

roads, fencing, MV electrical cabling, and solar panel structures. Construction may also include an operations and maintenance building.

Project Permitting
The proposed Project will require a siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC.

PA 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 MW or more, to wind projects with a capacity of 100 MW or more, and energy storage facilities with a capacity of 50 MW or more. Projects that fall into these categories must identify and provide information on the effects of the Project on environmental, natural, and cultural resources. Additional PA 233 information is available online at State Project Reviews | MiPlace[2], and a Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the MPSC is available online at Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the Michigan Public Service Commission. [3]

Cultural Resource Investigations
The APE is the area in which the proposed Project may cause alterations in the character or use of historic resources. As the site plan boundary includes all locations that may be impacted by ground disturbing activities related to the project undertaking, it is considered the physical APE (see Figure 1). The visual APE for assessing visual effects to historic-age resources is a 0.5-mile buffer from the boundaries of the Project area (e.g., leased area/project boundary) (see Figure 2). This boundary will be modified based on visual intrusions that may obscure the project.

Rouget Road Solar Farm has contracted SWCA Environmental Consultants (SWCA) to conduct the archaeological and architectural history surveys. Due to the presence of previously--documented archaeology sites in and near the Project area, and the archaeological sensitivity for the River Raisin Valley, SWCA will conduct a full archaeological survey for the physical APE, including staging areas. The boundaries of [redacted], is mapped as lying within the proposed Project area; however, these site boundaries are mapped based off archival records and the extent of the complex is poorly understood. In order to be sensitive toward this [redacted], we are asking for your input on the extent of the complex and the survey methodologies that may be necessary beyond [redacted] An Unanticipated Discoveries Plan (Exhibit A-1.14 in the MPSC permit application) has been prepared.

Summary of Requested Action
We look forward to consulting with your office on this Project and to a continued dialogue. We ask that you provide any comments regarding the Project area following your review of the enclosure. Please use the above Project name and Project description in your reply.

In summary, the MPSC and Rouget Road Solar Farm are requesting Tribal Governments to:

[2] https://www.miplace.org/historic-preservation/programs-and-services/cultural-resource-management-and-planning/state-project-reviews/

[3] https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/consumer/MPSC_Tribal_Involvement_Guide.pdf?rev=399582a67fbe46e883e6f21d1325e785&hash=AA471378E81539AFBBA758AB04FB3D25

1. Review the Project information.
2. Identify cultural or environmental concerns.
3. Provide feedback on archaeological methodologies (especially near site 20LE28).
4. Ensure that any cultural resources are addressed in the MPSC permitting process.

All comments will be documented and considered in Project design and the forthcoming MPSC state siting process. Consultation with SHPO and the THPOs included in the distribution list below will be incorporated into the cultural survey plan, recordation, and design updates as needed. Your timely response will greatly help us incorporate your concerns into the development of the Project. For that purpose, we request that you provide comments by December 20, 2025.

Tribal consulting parties may respond to myself (Kevin Cole) at rougetroadsola@rwe.com with any comments or concerns. Alternatively, you can reach out directly to Gustavo Cordero at the MPSC at corderog@michigan.gov.

Respectfully,

Kevin Cole
RWE Development Manager
rougetroadsola@rwe.com

cc: Gustavo Cordero, Michigan Public Service Commission
Carol McKnight, SWCA Environmental Consultants
Anna Gilmer, SWCA Environmental Consultants

Distribution List:
Forest County Potawatomi Community, Wisconsin
Hannahville Indian Community, Michigan
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
Little Traverse Bay Bands of Odawa Indians, Michigan
Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan
Menominee Indian Tribe of Wisconsin
Miami Tribe of Oklahoma
Pokagon Band of Potawatomi Indians, Michigan and Indiana
Sault Ste. Marie Tribe of Chippewa Indians, Michigan
Seneca-Cayuga Nation

Enclosures:
1. Figures
    a. Figure 1: State location map
    b. Figure 2: Portions of the USGS 7.5' series Tecumseh South and Palmyra Michigan Topographic Quadrangles showing the Project area.
    c. Figure 3: Aerial view of the Project area location in Palmyra Township, Lenawee County, Michigan.
2. Cultural Desktop Report
3. SHPO PA233 Response

Figure 1. Location of the proposed Rouget Road Solar Project Area in Michigan.

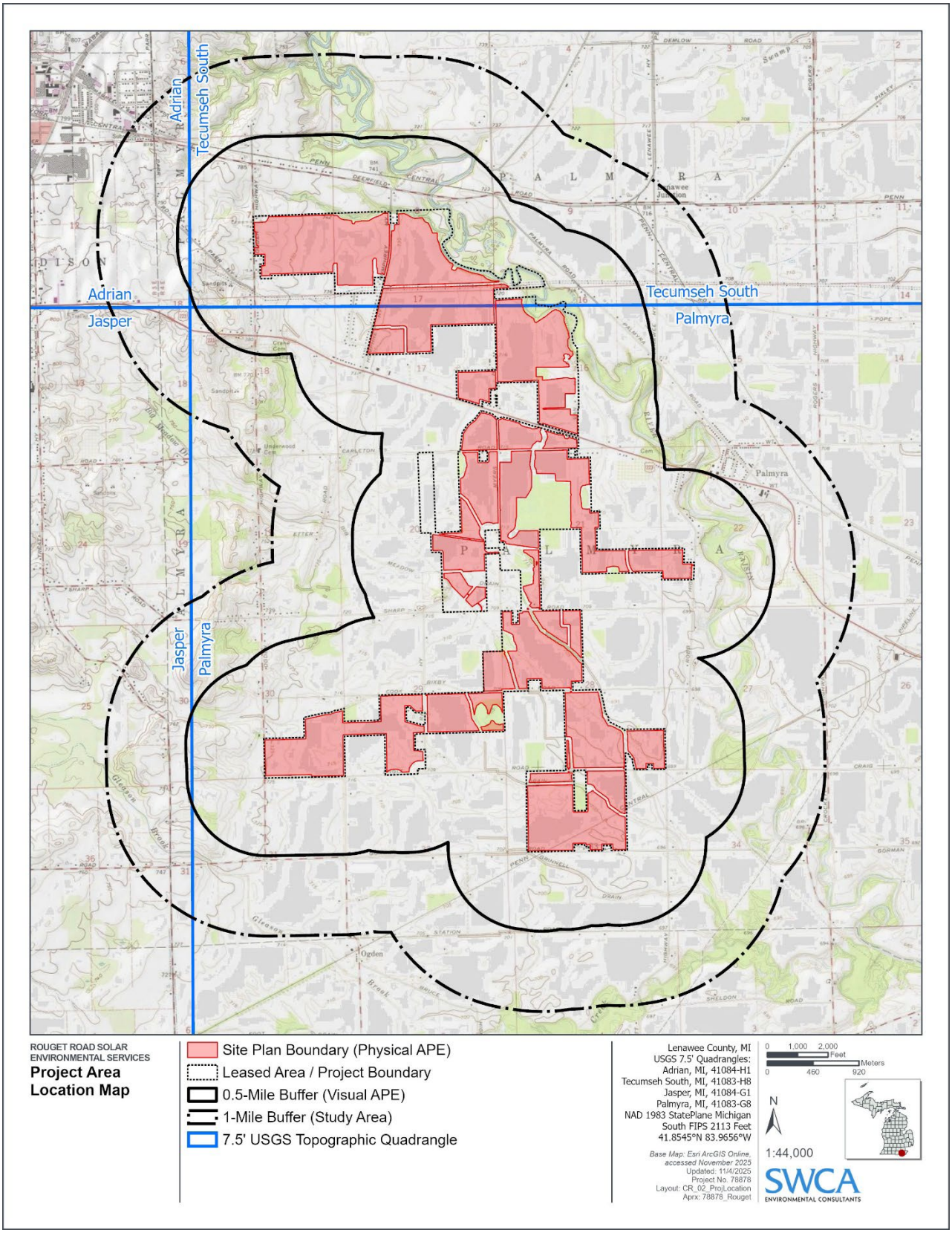

Figure 2. Portions of the USGS 7.5' series Tecumseh South and Palmyra, Michigan Topographic Quadrangles showing the site plan boundary and leased area/Project boundary.

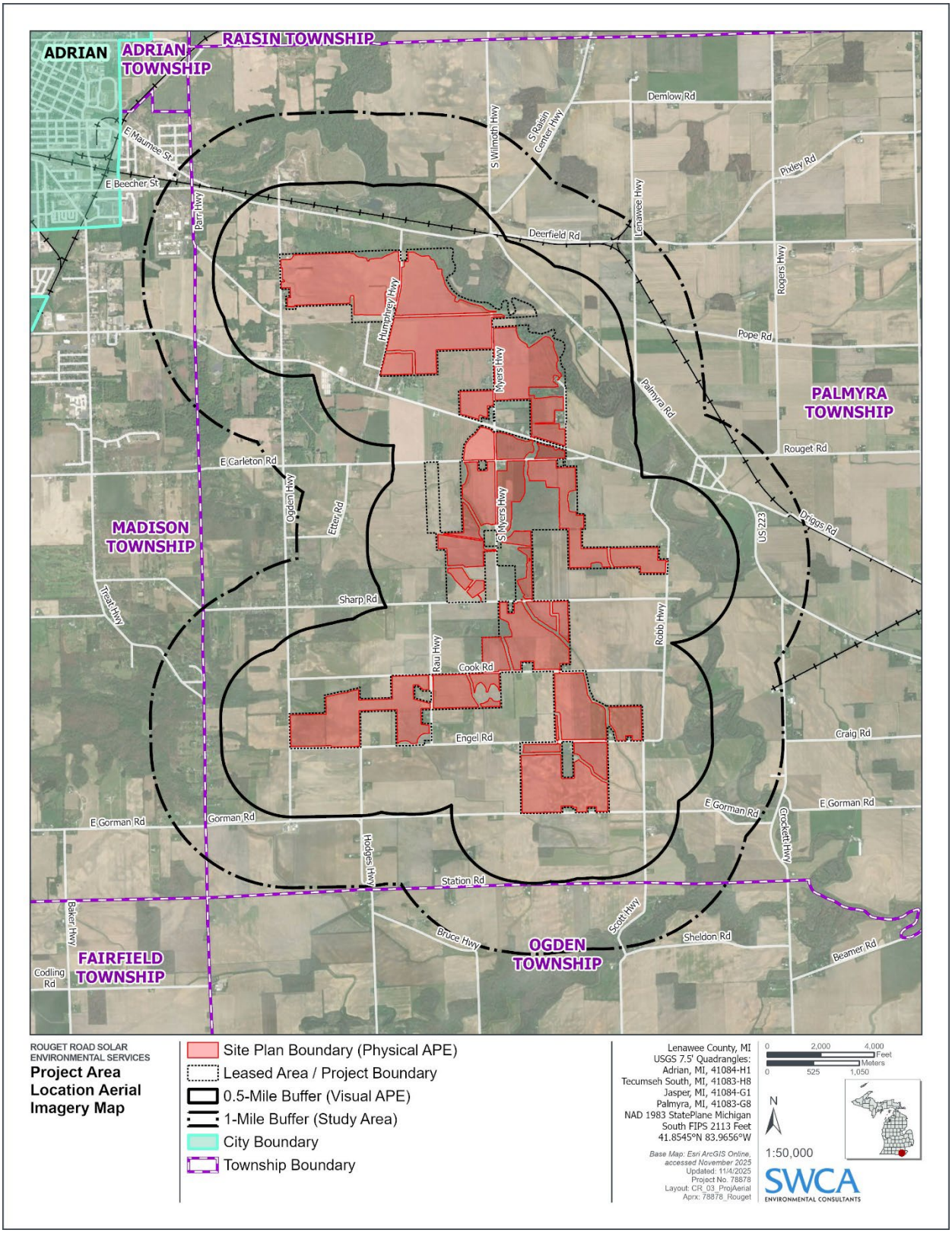

Figure 3. Aerial view showing the site plan boundary and leased area/Project boundary in Palmyra Township, Lenawee County, Michigan.

Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan

JANUARY 2025

PREPARED FOR

Rouget Road, LLC

PREPARED BY

SWCA Environmental Consultants

CULTURAL RESOURCES DESKTOP REVIEW FOR THE ROUGET ROAD, LLC LENAWEE COUNTY, MICHIGAN

Prepared for

Rouget Road, LLC
353 North Clark Street, 30th Floor
Chicago, Illinois 60654
Attn: J Kevin Cole

Prepared by

Rachel Lawrence, M.A., RPA
Heather MacIsaac, B.A.

and

Anna Gilmer, M.A., RPA

SWCA Environmental Consultants
200 22nd Street, Suite 220
Lombard, Illinois 60148
(630) 705-1762
www.swca.com

SWCA Project No. 78878

SWCA Cultural Resources Report No. 25-27

January 2025

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1 INTRODUCTION

SWCA Environmental Consultants (SWCA) completed a cultural resources desktop review for the proposed Rouget Road, LLC (project), located in Lenawee County, Michigan (Figure A-1 in Appendix A). The Project Area spans approximately 2,490 acres (1,008 hectares) of privately owned land near the towns of Adrian, Palmyra, and Ogden. SWCA completed the desktop review for the Project Area plus a surrounding 1.0-mile (1.6-kilometer) buffer around the Project Area. The surrounding 1.0-mile buffer is henceforth referred to as the Study Area (Figures A-2 and A-3).

The objective of the desktop review was to identify existing cultural resources within the Project Area and Study Area to inform project facility siting. Additionally, the Study Area was evaluated to gain an understanding of the type and density of cultural resources in the vicinity of the Project Area. This report summarizes the methods SWCA used to complete the desktop review and presents the results of the background research. It does not serve as Section 106 clearance for the proposed project.

2 REGULATORY FRAMEWORK

Projects in Michigan can come under the purview of two primary cultural resources regulations, the National Historic Preservation Act (NHPA) and Michigan's Natural Resources and Environmental Protection Act. Both are administered by the Michigan State Historic Preservation Office (MI SHPO).

If the project is deemed a federal undertaking (requiring a federal permit, license, or approval; being located on federally owned or managed land; or receiving federal financial assistance), a cultural resources survey most likely would be mandated to ensure compliance with Section 106 of the NHPA. The scope of required cultural resources surveys would then be determined by the functioning federal lead agency in cooperation with the MI SHPO and, if applicable, the pertinent Tribal Historic Preservation Offices as defined in both Section 101 of the National Environmental Policy Act and Section 106 of the NHPA.

Under Michigan law, the state oversees all archaeology performed on state land. The Natural Resources and Environmental Protection Act (Public Act 451 of 1994, Part 761) requires that a permit be obtained prior to undertaking any archaeological investigation on state land.

Public Act 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 megawatts or more, to wind projects with a capacity of 100 megawatts or more, and to energy storage facilities with a capacity of 50 megawatts or more. Public Act 233allows developers the option of applying to the Michigan Public Service Commission (MPSC) to construct utility-scale renewable energy facilities if the local unit of government does not have a compatible renewable energy ordinance. If a compatible renewable energy ordinance is in place, the developer must apply with the local unit of government first, but if the project is denied, the developer may submit to the MPSC for approval. Projects that fall into these categories must identify and provide information on the effects of the project on environmental, natural, and cultural resources.

The project will occur solely on privately held land; thus, no state or local laws requiring archaeological investigations or surveys are anticipated to apply for this project. However, Public Act 233 requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC.

3 METHODOLOGY

SWCA initially submitted a request for in-person research to the MI SHPO on April 7, 2023. Staff at the MI SHPO approved the request and scheduled a research appointment for April 20, 2023. An SWCA archaeologist obtained information in person on previous cultural resources surveys, previously recorded archaeological resources, and previously recorded postcontact architectural resources within the Study Area.

As the Project Area and Study Area were revised in fall 2024, SWCA submitted a second request to the MI SHPO for archaeology and survey site files within the revised Study Area. MI SHPO provided all available records on December 9, 2024. Due to the ongoing updates to the MI SHPO's database, a process that was initiated on February 24, 2024, only archaeology files are currently available. Postcontact architecture files and both postcontact architectural and archaeological survey reports are not currently available as the MI SHPO are scanning these files for upload into a new database. As such, SWCA relied on the April 2023 postcontact architectural resource files and survey reports for this review. SWCA additionally reviewed the National Register of Historic Places (NRHP) database for Michigan as the best available recent data regarding architectural resources.

In addition to the site file search, SWCA investigated historic plat and topographic maps and historic aerial imagery of the Project Area and Study Area. SWCA also researched environmental factors such as modern and historic land use and soil units mapped by the Natural Resources Conservation Service (NRCS) to determine the likelihood of the project to encounter previously unrecorded precontact or postcontact archaeological resources.

4 RESULTS

4.1 Physiography, Geology, and Soils

The Project Area is situated within the Erie-Huron Lake Plain of the Eastern Lake section of the Central Lowland province of the Interior Plains (NRCS 2022:343). The Erie-Huron Lake Plain is a fairly level glacial lake plain with scattered sandy ridges formed by former shorelines and moraines. Elevation ranges from approximately 570 to 815 feet (175 to 250 meters [m]), whereas local relief averages 10 feet (3 m). Major confluences in the Erie-Huron Lake Plain include the Clinton, Huron, and Saginaw Rivers, which empty into the Great Lakes. The Project Area is located within the Floodwood Creek-River Raisin watershed and the Big Meadow Drain-Black Creek watershed, which empty into the River Raisin (U.S. Environmental Protection Agency 2023). Mississippian- to Silurian-age limestone, shale, and dolomite are common along the surface and along the shores of Lake Erie and Lake Huron. Broad, level, and somewhat poorly drained lake plains feature American beech, sugar maple, silver maple, green ash, pin oak, swamp white oak, and American elm, whereas sandy areas feature eastern white pine, eastern hemlock, and other coniferous trees (NRCS 2022:344).

This ecoregion is also part of the Maumee Lake Plain and the Ann Arbor Moraines sub-subsections. The Maumee Lake Plain is a broad, flat, glaciated clay lake plain with rich, loamy soils deeply mantled by till and outwash and dissected by broad glacial drainageways containing sandy soils (Albert 1995). This region formerly included beech-sugar maple forest, elm-ash forest, deciduous swamps, white oak-black oak savannas, wet prairies, and coastal marshes, but now has been largely cultivated (Albert 1995; NRCS 2022). The Ann Arbor Moraines sub-subsection is a long, narrow band of fine- and medium-textured end and ground moraine bordered by flat lake plain on the east and by sandy outwash, end moraine, and ice-contact features to the west. This region formerly supported oak and oak-hickory forests, with oak

savannas along the western edge (Albert 1995). Major wildlife species in the Erie-Huron Lake Plain area include white-tailed deer; cottontail rabbits; squirrels; raccoons; pheasants; bobwhite quail; songbirds; various species of snakes, frogs, and turtles; sunfish; perch; bass; walleye; catfish; carp, sucker; and northern pike.

There are 40 soil series mapped within the Project Area by the NRCS (Table 1). The soils range from very poorly drained to excessively drained loams to sandy loams. The most common soils for the Project Area include Brady and Macomb loams, 0 to 3 percent slopes; Colwood very fine sandy loam, 0 to 3 percent slopes; Wauseon loam, 0 to 3 percent slopes; Ziegenfuss clay loam, 0 to 1 percent slopes; Brady and Macomb sandy loams, 0 to 3 percent slopes; and Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes. These soil types, and their implication for site formation processes and archaeological potential, are discussed further in Section 4.6.

Table 1. Soils within the Project Area

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
BbA	Berrien loamy sand, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BbB	Berrien loamy sand, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcA	Berrien sandy loam, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcB	Berrien sandy loam, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BhA	Brady sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on strand plains	Loamy over sandy and gravelly glaciofluvial deposits
BkA	Brady and Macomb loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BnA	Bronson sandy loam, 0 to 3 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BnB	Bronson sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BoA	Brookston loam, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
CbB	Cadmus sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over loamy till
CeA	Colwood very fine sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CgA	Conover loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Loamy till
GbA	Genesee sandy loam, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
GcA	Genesee and Eel loams, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GgA	Griffin and Sloan loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Clayey till
KbC	Kendallville sandy loam, 7 to 15 percent slopes	Well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over till
KeA	Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on deltas	Stratified loamy glaciofluvial deposits
LcA	Linwood muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Wood organic material over loamy till
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Drainageways on till-floored lake plains	Sandy and/or loamy glaciofluvial deposits over loamy till
NaA	Nappanee silt loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Clayey till
NbB	Nappanee loam, 3 to 7 percent slopes	Somewhat poorly drained	Knolls on ground moraines	Clayey till
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	Somewhat poorly drained	Knolls on ground moraines	Clayey till
OcC	Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded	Excessively drained	Beaches on till-floored lake plains	Glaciofluvial deposits and/or sandy glaciolacustrine deposits over loamy till
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	Poorly drained	Depressions on till plains	Loamy till
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PdB	Plainfield and Berrien loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PeB	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PwmaaA	Pewamo clay loam, dense substratum, 0 to 1 percent slopes	Poorly drained	Drainageways on nearshore zones (relict), flats on nearshore zones (relict)	Clayey till over dense till
RbA	Rollin muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Herbaceous organic material over marl
SbA	Sebewa sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on glacial drainage channels	Loamy over sandy and gravelly glaciofluvial deposits
Sf	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	Poorly drained	Drainageways on stream terraces, drainageways	Loamy drift over sandy and gravelly outwash
WcA	Wauseon loam, 0 to 3 percent slopes	Poorly drained	Depressions on till-floored lake plains	Glaciolacustrine deposits over clayey till

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	Poorly drained	Wave-worked till plains	Clayey till over loamy till
W	Water	N/A	N/A	N/A

Source: NRCS (2024).

4.2 Historical Land Use

SWCA reviewed historic plat and topographic maps, as these sources provide information on past land use within the Project Area and Study Area that may indicate the probability of encountering significant precontact and postcontact cultural resources in or near the Project Area. The historic maps indicate that there has been a general consistency in the road network and land-use patterns from the late nineteenth century into the modern era in the Study Area.

The earliest available map of the Project Area is an 1819 General Land Office survey map (Bureau of Land Management General Land Office 2024). The Project Area is uninhabited. The River Raisin is drawn as a winding water course east of the Project Area. There are patches of marshlands, and tributaries are marked but not fully drawn. No structures are depicted. Palmyra and Lenawee Junction have not yet been established.

The first available plat map, dated 1874, shows that the Project Area and Study Area had been divided into large landholdings. Residences, schools, and churches are depicted. Roads and three railroads also are in place, including the Lenawee County Railroad and Palmyra Road. The current U.S. Highway 233 is shown as a railroad. Several structures are depicted on landholdings within the Project Area. Some of these structures are adjacent to orchards or small agricultural fields. There are branches of unnamed tributaries flowing throughout the Project Area, one of which is the modern Big Meadow Drain (Everts and Stewart 1874).

By 1893, the Project Area is depicted similarly to the 1874 plat. More landowners have appeared, represented by smaller landholdings, and structures are depicted within the Project Area. The unnamed tributaries are still depicted, running through the central and southern portions of the Project Area (Cadwell 1893).

The 1916 plat map shows an increase in landowners once more as the communities of Lenawee Junction and Palmyra continue to grow. Structures also are depicted on these parcels in the Project Area and are shown mostly along roads. U.S. Highway 233 is depicted as the Toledo Western electric railroad. There is another railroad that runs north-south to the Toledo Western electric railroad, connecting from Adrian to Palmyra within the Project Area. This segment of rail had been a road on the 1874 and 1893 plat maps. Several tributaries also are shown within the Project Area (Ogle 1916).

The 1921 plat map does not show individual structures beyond churches and schools, neither of which are in the Project Area. Landowner names are given, and the road network and railroads appear in the same location as on previous plats (*Adrian Daily Telegram* 1921). The 1928 plat presents the same information (*Adrian Daily Telegram* 1928).

SWCA also reviewed historic topographic maps to determine the land use of the Project Area and Study Area. Four historic topographic maps from 1939 to 1972 show that there has been little development from the early twentieth century to the present (U.S. Geological Survey [USGS] 2024). On the earliest available topographic map (Blissfield, Michigan, 1939, 1958 edition), multiple structures are shown in the

Project Area along roadways. The tributaries shown on the plat maps are named and shown: Big Meadow Drain, Bixby Drain, and Grinnell Drain. The road network and railroads are also depicted. The 1941 Blissfield, Michigan, topographic map reveals a similar image. The 1972 Palmyra, Michigan, and 1972 Tecumseh South, Michigan, topographic quadrangles name most of the roads in the Project Area, and they show that residential development had not increased outside of Palmyra and Adrian. Transmission and telecommunication cables are also depicted (USGS 2024).

A review of 17 aerial photographs taken between 1955 and 2022 indicates that minimal land development occurred within the Project Area and its environs. On the aerial images beginning in 1955, the landscape is agricultural. Isolated farmsteads are visible along roadways outside of Palmyra, Lenawee Junction, and Adrian. Drainages are visible either as scars on the landscape or are lined with trees, as is the River Raisin. There are some stands of trees throughout the Project Area. Between 1955 and 2022, no noticeable changes occur to the land use in the Project Area or Study Area (Historic Aerials 2024).

4.3 Previous Cultural Resources Surveys

A review of MI SHPO records identified one cultural resources survey that was conducted in the Project Area and two cultural resources surveys conducted within the Study Area (Table 2). Project ER00-7.17.161134 was a reconnaissance investigation conducted in 2017 by Archaeological Consultants of Ossian. The survey area covered 0.44 acre of land, and no cultural resources were identified during the survey (Stillwell 2017). Project ER17-391 was conducted for the Howard Street/West Michigan CMAQ and Rehabilitation project; however, the MI SHPO records did not contain information on the surveyors, year, or report title. Project B17-258, identified on quad maps in the MI SHPO research repository as Lauterbur 2016, was a Phase I archaeological survey conducted in support of the replacement of the River Raisin Bridge in Palmyra, Michigan. The MI SHPO records did not include information on the extent of the survey; however, no archaeological sites were identified during the survey.

Table 2. Previous Cultural Resources Surveys in the Study Area

Project ID	Project Name	Survey Year	Surveyors	Report Title	Location
ER00-7.17.161134	G2 Cellular Tower Site Review #161134	2017	Archaeological Consultants of Ossian	*An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project #161134) in Palmyra, Lenawee Conty, Michigan. 17FR29Mi.*	Project Area
ER17-391	Howard Street/ West Michigan CMAQ and Rehabilitation	None recorded	None recorded	None recorded	Study Area
B17-258	Lauterbur 2016	2016	Michigan Department of Transportation	*Archaeological Investigations at US-223 River Raisin Bridge Replacement, Palmyra, Lenawee County.*	Study Area

4.4 Previously Recorded Archaeological Sites

[redacted]

[redacted]

4.5 Previously Recorded Architectural Resources and Cemeteries

SWCA reviewed the National Park Service's NRHP database for Lenawee County, Michigan, regarding information on historic districts, buildings, archaeological sites, and other properties eligible for or listed in the NRHP. The NRHP database did not identify any NRHP-listed resources within the Project Area (National Park Service 2024).

SWCA also reviewed historic architecture data provided by the MI SHPO in April 2023. No previously recorded architectural resources are located within the Project Area; three architectural resources are located in the Study Area (Table 4; Appendix A: Figure 5).

No recorded cemeteries are present in the Project Area; two postcontact cemeteries (Palmyra Village Cemetery and Crane Cemetery) are located within the Study Area (Table 5; Appendix A: Figure 5). Palmyra Village Cemetery was included in the MI SHPO site file data, while Crane Cemetery was identified through archival research of historic topographic maps. Due to the data gap in the MI SHPO site file records since February 2024, it is not clear if Crane Cemetery is still absent from MI SHPO site file records.

Table 4. Previously Recorded Historic Architectural Resources in the Study Area

Site ID	Historic Name	City	NRHP Status	Location
P23943	Palmyra Presbyterian Church	Palmyra	Unevaluated	Study Area
P61449	Bruce Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area
P61451	Scott Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area

Table 5. Previously Recorded Cemeteries in the Study Area

Historic Name	Record Source	Location
Palmyra Village Cemetery	MI SHPO site file data	Study Area
Crane Cemetery	Archival research	Study Area

4.6 Geoarchaeology

Geoarchaeology, which is a multidisciplinary field that incorporates topography, geomorphology, geology, and soils, helps archaeologists to understand how geological processes have influenced the preservation of archaeological sites. Research conducted by Monaghan and Lovis (2005) demonstrates that deeply buried soils have an increased probability of sustaining cultural resources where fluvial deposits overlie alluvial deposits as a result of waterways breaching their banks. Monaghan and Lovis developed a predictive geoarchaeological model that takes these effects into account and classifies an area's likelihood of having cultural resources from Low to High-Very High.

Based on the Monaghan and Lovis (2005) model, the Project Area intersects with areas modeled as having moderate to high potential for deeply buried archaeological deposits (Figure A-6). [redacted] Otherwise, the remainder of the Project Area is largely mapped as exhibiting a low potential for deeply buried archaeological deposits.

[redacted]

4.7 Cultural Resources Context and Potential

The potential of the Project Area to contain cultural resources was developed through examination of the natural and topographical characteristics of the Project Area and available historic-era maps and aerial photographs.

4.7.1 Potential for Precontact Archaeological Sites

[redacted]

4.7.2 Potential for Postcontact Archaeological Sites

[redacted]

5 SUMMARY AND RECOMMENDATIONS

In summary, the records review established that one cultural resources survey has been conducted previously within the Project Area, and two cultural resources surveys have been conducted in the Study Area. These compliance surveys were negative and did not result in the recordation of cultural resources within the Project Area or the Study Area. However, [redacted] None of the archaeological sites within the Project Area have been evaluated for listing in the NRHP. There are no previously recorded architectural resources within the Project Area and three architectural resources in the Study Area. Based on MI SHPO records and a review of the NRHP, there are no NRHP-listed resources located within the Project Area or Study Area.

There is an overall moderate probability for significant precontact archaeological sites and a low to moderate probability for significant postcontact archaeological sites within the Project Area. [redacted]

Should the project require archaeological survey, the geoarchaeological modeling (Monaghan and Lovis 2005) suggests that shovel testing and/or deep testing (e.g., auguring) may be necessary [redacted] Pedestrian survey is a viable survey methodology as long as alluvial soils are confined to the plow zone (e.g., 12 inches [30 centimeters]); the limits of shovel testing is typically 3 feet (1 m).

Based on the MPSC regulations and our communications with the MI SHPO (personal communication, Sarah Surface-Evans and Scott Slagor, January 30, 2025), SWCA recommends initiating consultation with the MI SHPO. SWCA understands that MI SHPO has initiated a new consultation process for projects subject to permitting through the MPSC, and that the MI SHPO will provide expert testimony regarding cultural resources to the MPSC. To initiate the consultation process, the MI SHPO requests developers to complete a consultation application, in coordination with a professional archaeologist and architectural historian, The MI SHPO will provide their recommendations for next steps, including survey and avoidance requirements. SWCA understands that RWE will have 1 year after submittal of the MPSC permit application to obtain the approval of survey reports or recommendations submitted to the SHPO.

In keeping with Public Act 233, which requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC, SWCA recommends this document be provided to the MPSC for review. Approval from the MPSC is required before development within the boundaries of these sites occurs.

6 REFERENCES CITED

Adrian Daily Telegram. 1921. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21190/Palmyra+Township/Lenawee+County+1921/Michigan/. Accessed November 14, 2024.

———. 1928. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/1610467/Palmyra+Township++Raisin+River/. Accessed November 14, 2024.

Albert, Dennis A. 1995. Regional landscape ecosystems of Michigan, Minnesota and Wisconsin: A working map and classification. General Technical Report NC-178. U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota. Available at: https://www.nrs.fs.usda.gov/pubs/gtr/other/gtr-nc178/index.html. Accessed November 1, 2024.

Bureau of Land Management General Land Office. 2024. Original Survey Plat, Township 7 North, Range 4 East, 3rd Principal Meridian. Available at: https://glorecords.blm.gov/details/survey/default.aspx?dm_id=27676&sid=usa5y3jo.a4o#surveyDetailsTabIndex=0. Accessed November 14, 2024.

Cadwell, George D. 1893. Atlas of Lenawee County, Michigan. Geo. D. Cadwell and Company, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21077/Palmyra+Township/Lenawee+County+1893/Michigan/. Accessed November 14, 2024.

Everts and Stewart. 1874. Combination Atlas Map of Lenawee County, Michigan. Everts and Stewart, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/20906/Palmyra+Township/. Accessed November 14, 2024.

Historic Aerials. 2024. Historic Aerials Viewer. Available at: https://www.historicaerials.com/viewer. Accessed November 14, 2024.

Monaghan, G. William, and William A. Lovis. 2005. *Modeling Archaeological Site Burial in Southern Michigan: A Geoarchaeological Synthesis*. Michigan State University Press, East Lansing.

National Park Service. 2024. National Register of Historic Places Database and Research. Available at: https://www.nps.gov/subjects/nationalregister/database-research.htm. Accessed January 13, 2025.

Natural Resources Conservation Service (NRCS). 2022. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. Washington, D.C.

———. 2024. Custom Soil Report. Available at: http://websoilsurvey.nrcs.usda.gov. Accessed December 12, 2024.

Ogle, George A. 1916. Standards Atlas of Lenawee County, Michigan. Geo. A. Ogle Publishers and Engravers, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/22243/Palmyra+Township/Lenawee+County+1916/Michigan/. Accessed November 14, 2024.

Stillwell, Larry N. 2017. *An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project No. 161134) in Palmyra, Lenawee County, Michigan*. Archaeological Consultants of Ossian. On file at the Michigan State Historic Preservation Office, Lansing, Michigan.

U.S. Environmental Protection Agency. 2023. How's My Waterway Viewer. Available at: https://mywaterway.epa.gov/. Accessed November 14, 2024.

U.S. Geological Survey (USGS). 2024. National Geologic Map Database Project TopoView. Available at: https://ngmdb.usgs.gov/topoview/viewer/#14/41.8731/-83.9695. Accessed November 14, 2024.

APPENDIX A

Figures

Figure A-1. Location of the proposed Rouget Road, LLC Area in Michigan.

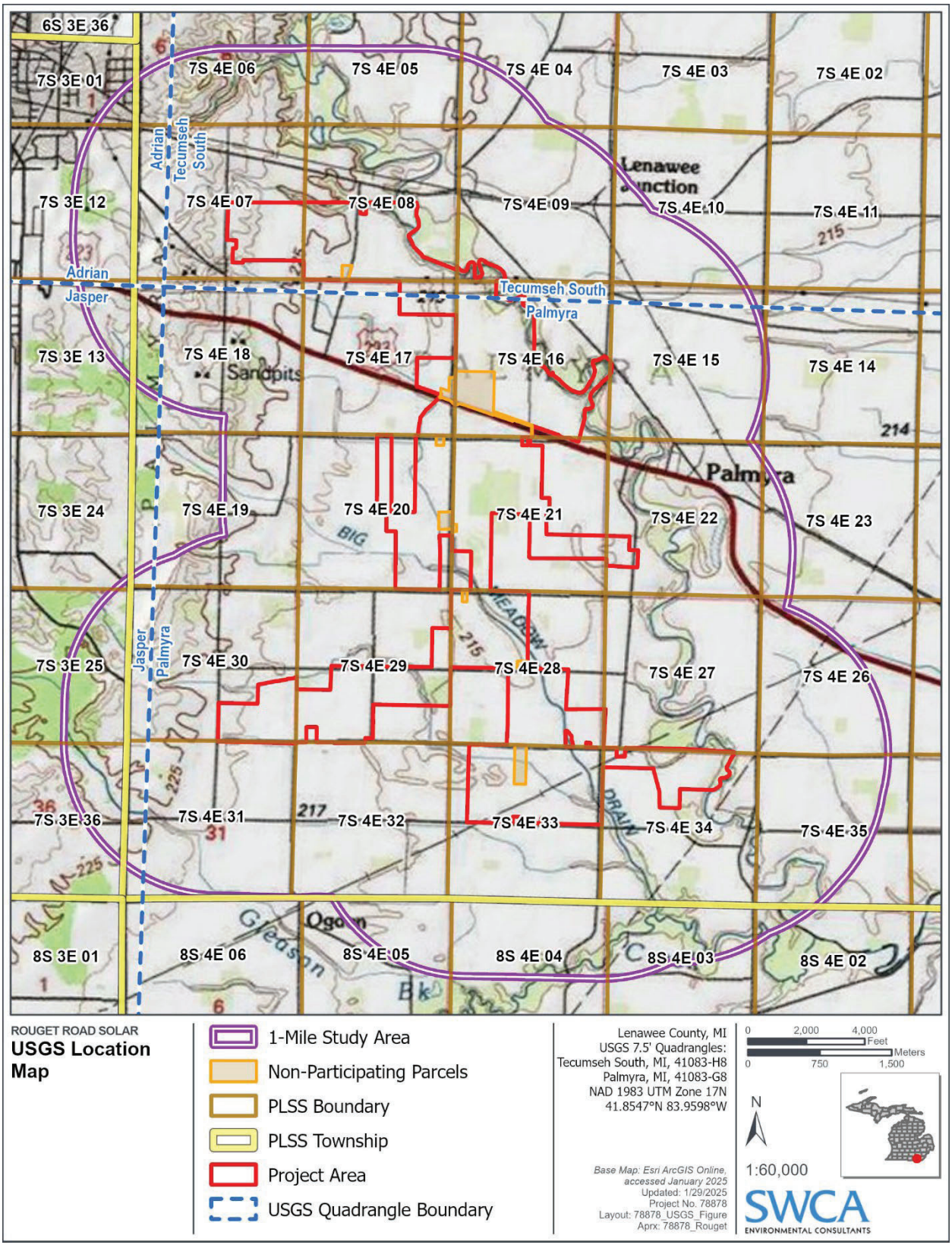

Figure A-2. Location of the Study Area for the proposed Rouget Road, LLC on a USGS topographic map.

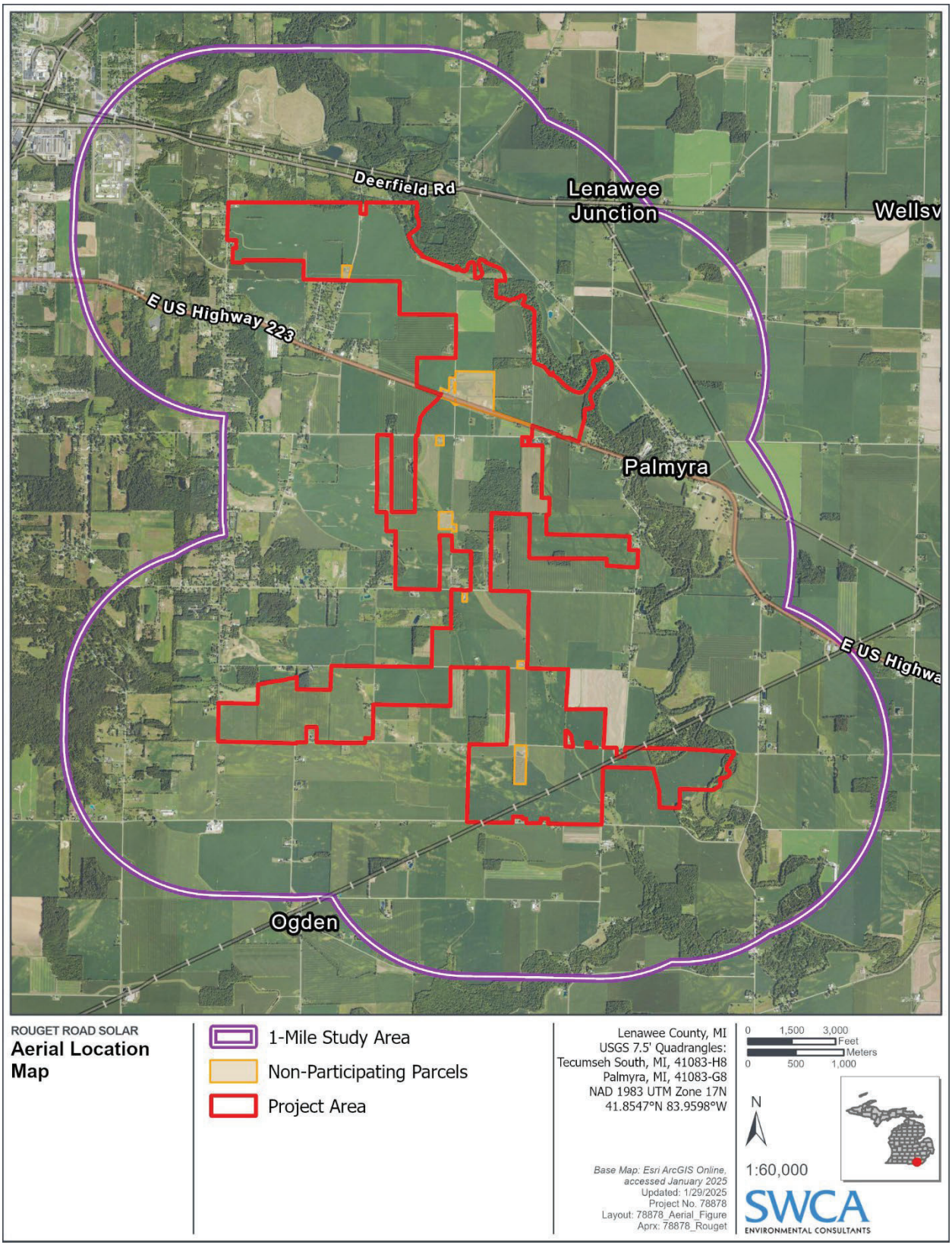

Figure A-3. Overview of the Study Area for the proposed Rouget Road, LLC on aerial imagery.

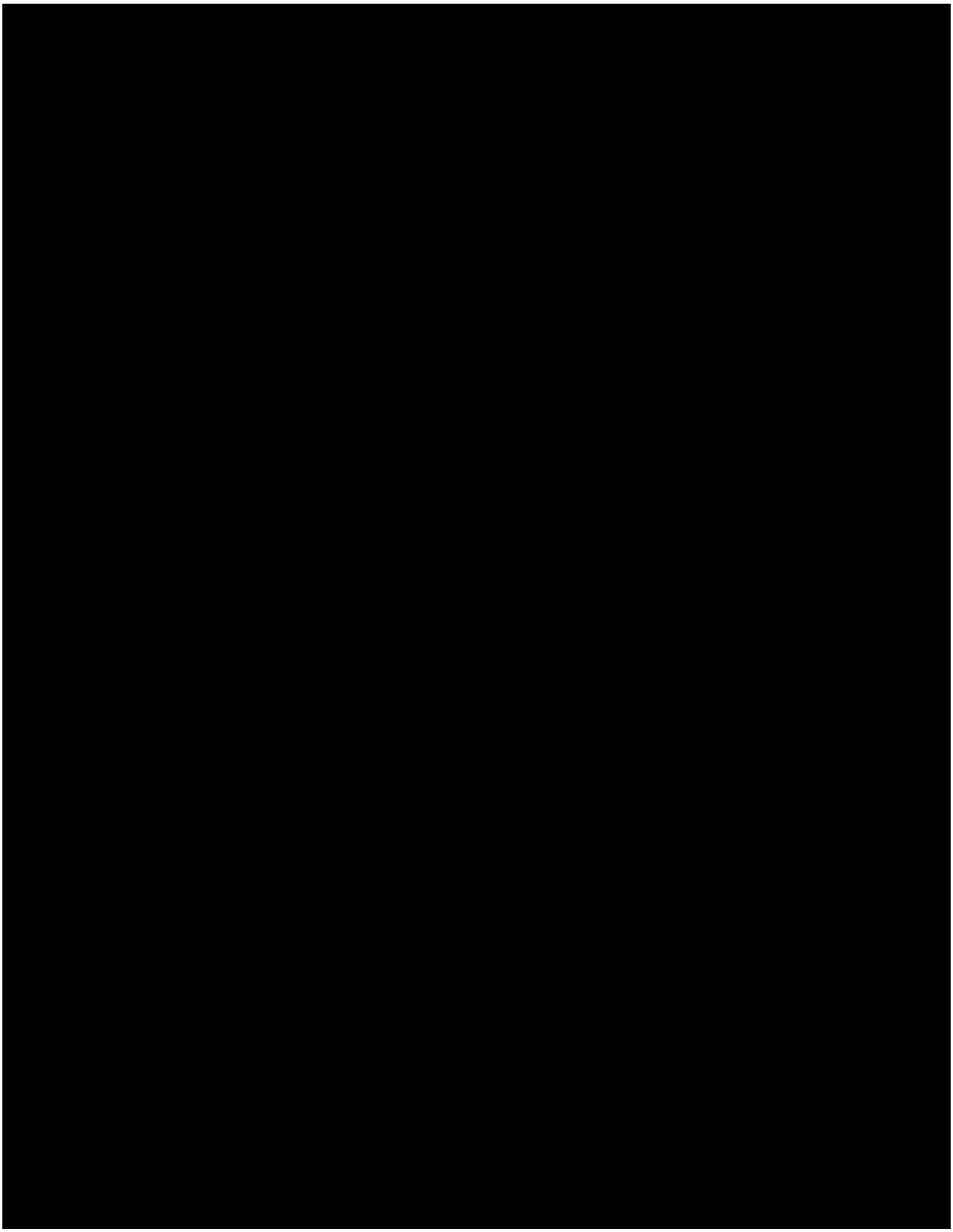

Figure A-4. Results of the background research for previously recorded cultural resources and previously conducted surveys.

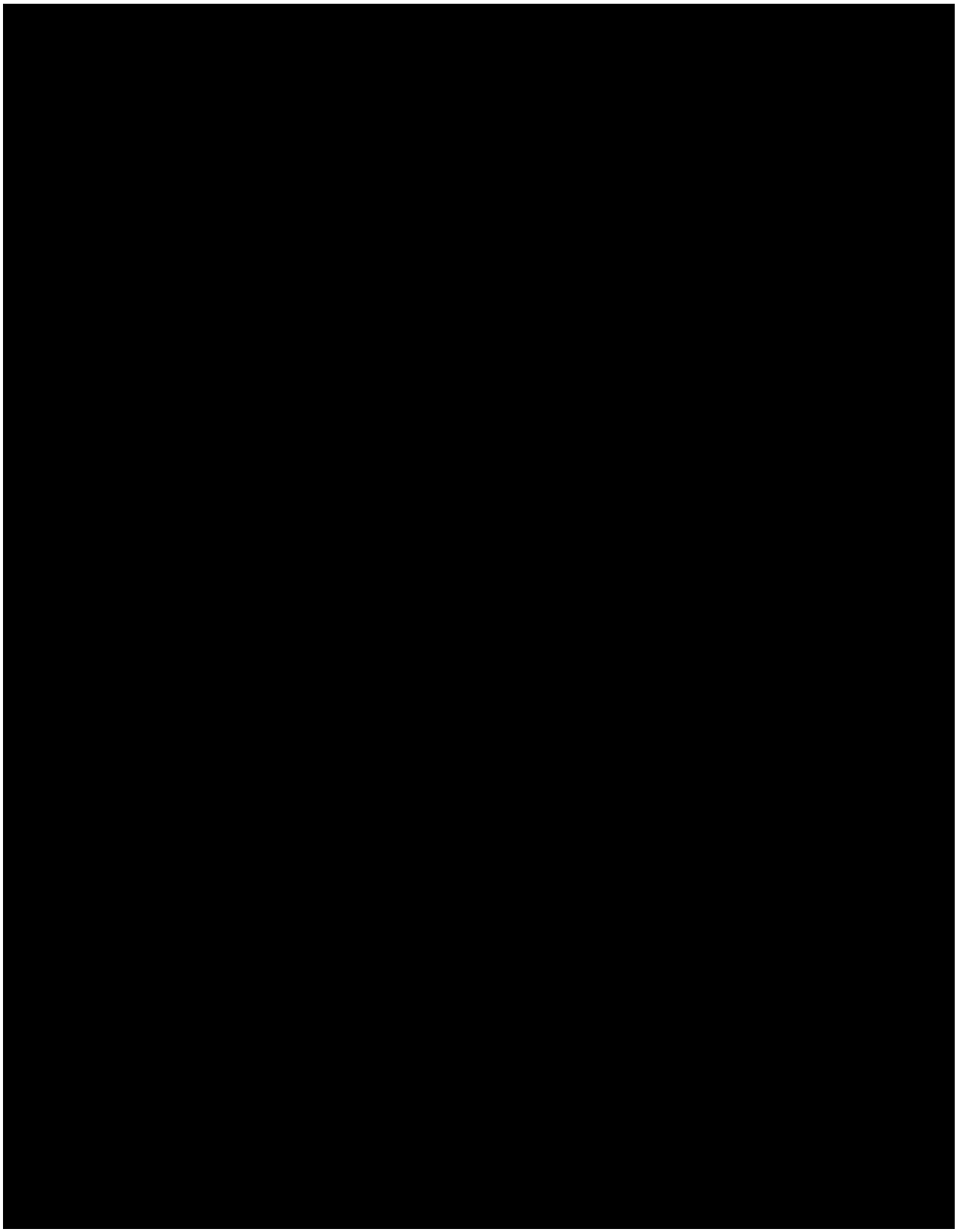

Figure A-5. Results of the background research for postcontact architectural resources and cemeteries.

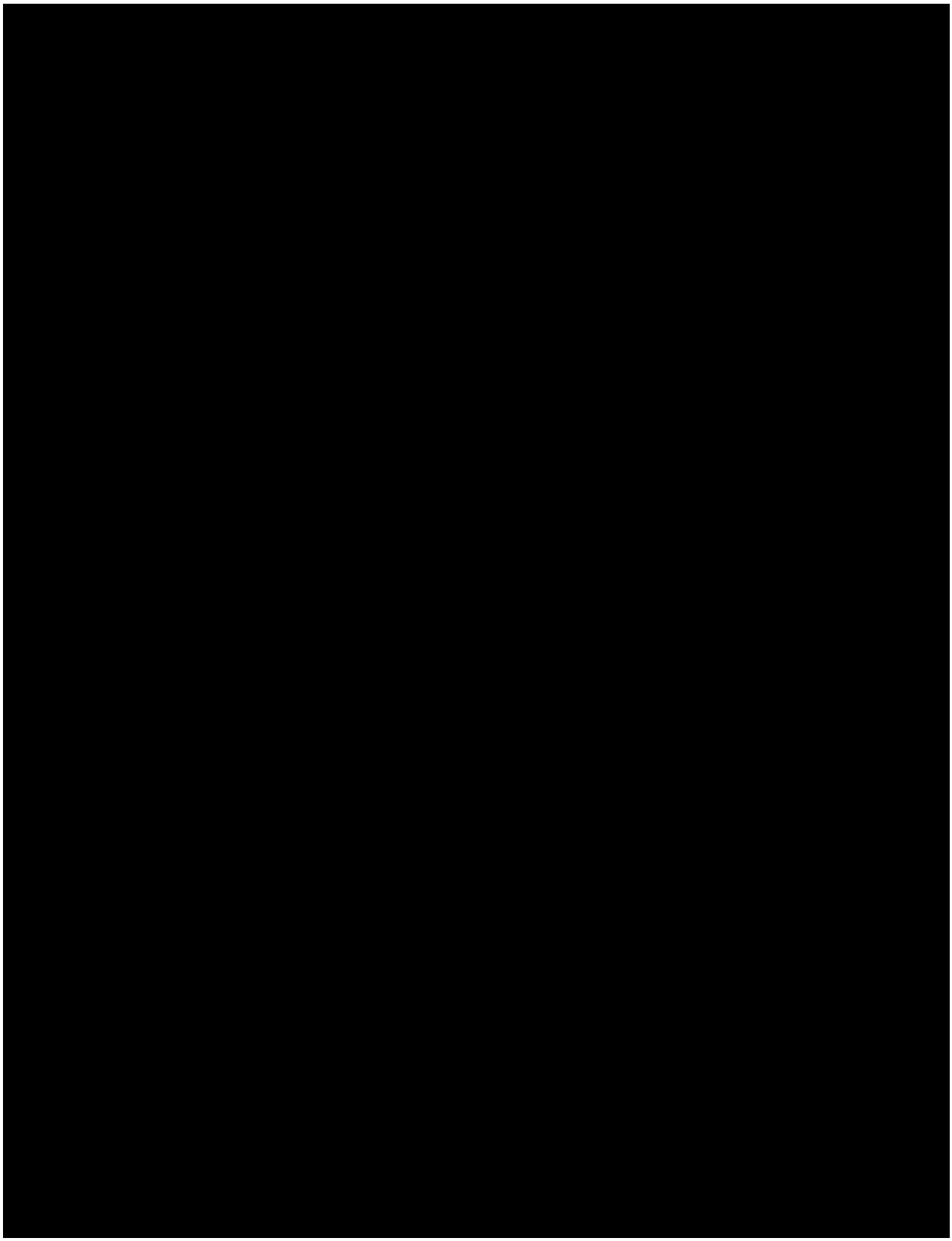

Figure A-6. Areas modeled as having moderate to high potential for deeply buried archaeological deposits in the Project Area and Study Area.

GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
MICHIGAN STRATEGIC FUND
STATE HISTORIC PRESERVATION OFFICE

QUENTIN L. MESSER, JR.
PRESIDENT

September 10, 2025

KEVIN COLE
ROUGET ROAD LLC
10250 PENLAWN DR.
JEROME, MI 49249

RE: SR25-23 PA233 Review Rouget Road, LLC Solar, T07S/R04E/Sec. 7, 8, 9, 15, 16, 17, 20 ,21, 22, 27, 28, 29, 30, 33, and 34, Palmyra Township, Lenawee County (MPSC)

Dear Mr. Cole:

We have received your request for review of the above-cited project under Public Act 233 of 2023 for Renewable Energy and Energy Storage Facility Siting (PA 233) at the above-noted location. We have reviewed the assessment prepared by SWCA, "Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan" and appreciate the information provided. To fully consider and address impacts to cultural and historic sites we require additional information, please send the following:

General

In the materials submitted, the project area boundaries in the submission form and in the Desktop Review do not match. Please ensure that we have the final project boundary maps included in all materials submitted to our office. Desktop Review states that the project plan will avoid archaeological sites, however, the project mapping provided does not make this apparent or clear. We cannot assess the impact of the proposed project on historic resources without accurate mapping information. Additionally, we would like to see the locations of staging areas, vehicle traffic, and any other areas that may have ground disturbance mapped.

Archaeological Resources

Due to the presence of previously documented sites within and near the project area, and the high archaeological sensitivity for the River Raisin valley generally, SHPO requests full archaeological survey for the entire project area, including staging areas. In particular, the boundaries of site 20LE28 are poorly delineated. In order to avoid this site, which is known to contain burials, additional survey methodologies may be necessary beyond pedestrian survey or shovel testing***. SHPO recommends consulting with our office and Tribal Nations with historic connections to this region to develop an appropriate methodology***, which may include geophysical prospection or historic human remains detection dog (HRD) survey. SHPO also recommends developing an Unanticipated Discovery Plan (UDP) for the project. A UDP specifies who will be contacted and what measures will be taken in the event of an unanticipated discovery of archaeological materials or human remains during the project implementation. Please see the UDP template attached, for an example of how these documents are organized. SHPO encourages the project proponent to work with consulting party tribes to develop an

appropriate UDP and protocol for handling human remains.

Above-ground Resources

SHPO concurs with the proposed methodology of utilizing the Above Ground Table in lieu of identification forms except that we require identification forms for properties that are identified as eligible. The table does not provide enough information for eligible properties. For eligible properties, photographs of all resources must also be included in an attachment with Architectural Properties Identification Form. When discussing effects to above-ground resources, please be sure to provide discussion of visual impacts as well as visual barriers in place that may play in to effects determinations. Also be sure that the Historic Resource Survey Report contains enough history and contextual information about the area and resources for SHPO to adequately assess eligibility.

Additional information must be submitted online through our Additional Information Portal.

Please note that our review cannot proceed until we are able to consider the information requested above. This letter is not concurrence. If you have any questions, please contact please contact Senior Archaeologist, Sarah Surface-Evans, surfaceevanss1@michigan.gov, (517) 282-7959 or Historian, Katlyn Burns Yancho, at 517-256-3416, burnsyanchok@michigan.gov. **Please reference our project number in all communication with this office regarding this review.** Thank you for your consultation.

Sincerely,

Sarah Surface-Evans, PhD, RPA
Senior Archaeologist

SES:KAK:KBY:SSE

Enclosure(s): UDP Template

Copy: Anna Gilmer, SWCA

Bay Mills Indian Community

From:	Jonathan Libbon
To:	paulacarrick@baymills.org
Cc:	Carol Mcknight; Aleyda Galan; Cole, J Kevin; Quarles, Mark
Subject:	Rouget Road Solar Consultation Letter
Date:	Thursday, November 20, 2025 4:02:00 PM
Attachments:	Rouget Tribal Consulation LTR_20Nov2025.pdf image001.png
Sensitivity:	Private

Good Afternoon Paula,

On behalf of Rouget Road Solar Farm LLC, a wholly-owned subsidiary of RWE Clean Energy LLC (RWE), we are reaching out to request your input on the Rouget Road Solar Farm Project, a proposed solar facility in Lenawee County, Michigan. The facility will require a state siting certificate from the Michigan Public Service Commission (MPSC). The attached letter and documentation outline the project and provide details on the cultural resource work completed to date. We are seeking comments from your area of expertise regarding any potential environmental or cultural effects associated with this project.

Please let me or Kevin Cole (cc'd), the project manager from RWE, know if you have any questions about the project.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

The contents of this email and any associated emails, information, and attachments are CONFIDENTIAL. Use or disclosure without sender's authorization is prohibited. If you are not an authorized recipient, please notify the sender and then immediately delete the email and any attachments.

11/20/2025

Dear Tribal Historic Preservation Officer and/or Tribal Cultural Representative,

As part of its responsibilities under Michigan Public Act 233 of 2023 (PA 233), *Renewable Energy and Energy Storage Facility Siting*, the Michigan Public Service Commission (MPSC) is seeking consultation (as required in PA 233 Section 224.1b[1]) and determining the area of potential effects ("APE") for the proposed project. Federally listed sovereign Nations with an interest in the state of Michigan are invited to review and comment on Rouget Road Solar Farm, LLC's (Rouget Road Solar Farm) (a wholly-owned subsidiary of RWE Clean Energy LLC [RWE]) proposed **Rouget Road Solar Farm Project** (the "Project"). The proposed Project will require a state-siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC (PA 233 Section 226.7b). Although Rouget Road Solar Farm requests a review and comment on the Project, the MPSC is the state agency and may be communicated with directly.

Based on Michigan State Historic Preservation Office (MI SHPO) guidance from their *Instructions for the Application for PA 233 Renewable Energy Storage Facility Siting Consultation Form*:

> "**Public Act 233** requires the applicant for energy siting and storage facilities to consider and address impacts *to the environment and natural resources, including, but not limited to, sensitive habitats and waterways, wetlands and floodplains, wildlife corridors, parks,* ***historic and cultural sites****, and threatened or endangered species*. The applicant must submit this information to the Michigan Public Service Commission (MPSC) for consideration in permitting the project. In order to facilitate considerations of historic and cultural sites (hereafter Historic Properties), the MPSC has required applicants to consult with the State Historic Preservation Office (SHPO)."

This letter is part of the early coordination phase of the environmental review process, requesting comments associated with this Project. We are requesting comments from your area of expertise regarding any possible environmental or cultural effects associated with this Project. Please provide any additional information you may have regarding potential cultural resources in the Project area so they may be accounted for during the environmental review of this Project. This information can be provided directly to RWE or the MPSC.

Project Description

The proposed Project is southeast of the city of Adrian, in Palmyra Township, Lenawee County, Michigan (Figure 1). Historic Mapping places the proposed Project area in Sections 7, 8, 9, 15, 16, 17, 20, 21, 22, 27, 28, 29, 30, 33, and 34 of Township 7 South, Range 4 East as seen on the enclosed USGS 7.5 series for Tecumseh South and Palmyra, Michigan Topographic Quadrangle map (Figure 2). Rouget Road Solar Farm is proposing to construct a 175-megawatt (MW) alternating current (AC) solar photovoltaic power generating facility. The leased area/Project area boundary includes approximately 2,142 acres (867 hectares) (Figures 2 and 3). Construction will require 1,513 acres (612 ha) of what is currently primarily agricultural land (see site plan boundary in Figure 1). Limited tree removal is planned across 7.96 acres (3.22 ha). Proposed work required for the Project includes construction of a switchyard, substations, access

[1] Sections refer to those found at: https://www.legislature.mi.gov/documents/2023-2024/publicact/htm/2023-PA-0233.htm

roads, fencing, MV electrical cabling, and solar panel structures. Construction may also include an operations and maintenance building.

Project Permitting
The proposed Project will require a siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC.

PA 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 MW or more, to wind projects with a capacity of 100 MW or more, and energy storage facilities with a capacity of 50 MW or more. Projects that fall into these categories must identify and provide information on the effects of the Project on environmental, natural, and cultural resources. Additional PA 233 information is available online at State Project Reviews | MiPlace[2], and a Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the MPSC is available online at Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the Michigan Public Service Commission. [3]

Cultural Resource Investigations
The APE is the area in which the proposed Project may cause alterations in the character or use of historic resources. As the site plan boundary includes all locations that may be impacted by ground disturbing activities related to the project undertaking, it is considered the physical APE (see Figure 1). The visual APE for assessing visual effects to historic-age resources is a 0.5-mile buffer from the boundaries of the Project area (e.g., leased area/project boundary) (see Figure 2). This boundary will be modified based on visual intrusions that may obscure the project.

Rouget Road Solar Farm has contracted SWCA Environmental Consultants (SWCA) to conduct the archaeological and architectural history surveys. Due to the presence of previously--documented archaeology sites in and near the Project area, and the archaeological sensitivity for the River Raisin Valley, SWCA will conduct a full archaeological survey for the physical APE, including staging areas. The boundaries of [redacted], is mapped as lying within the proposed Project area; however, these site boundaries are mapped based off archival records and the extent of the complex is poorly understood. In order to be sensitive toward this [redacted], we are asking for your input on the extent of the complex and the survey methodologies that may be necessary beyond [redacted] An Unanticipated Discoveries Plan (Exhibit A-1.14 in the MPSC permit application) has been prepared.

Summary of Requested Action
We look forward to consulting with your office on this Project and to a continued dialogue. We ask that you provide any comments regarding the Project area following your review of the enclosure. Please use the above Project name and Project description in your reply.

In summary, the MPSC and Rouget Road Solar Farm are requesting Tribal Governments to:

[2] https://www.miplace.org/historic-preservation/programs-and-services/cultural-resource-management-and-planning/state-project-reviews/

[3] https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/consumer/MPSC_Tribal_Involvement_Guide.pdf?rev=399582a67fbe46e883e6f21d1325e785&hash=AA471378E81539AFBBA758AB04FB3D25

1. Review the Project information.
2. Identify cultural or environmental concerns.
3. Provide feedback on archaeological methodologies (especially near site 20LE28).
4. Ensure that any cultural resources are addressed in the MPSC permitting process.

All comments will be documented and considered in Project design and the forthcoming MPSC state siting process. Consultation with SHPO and the THPOs included in the distribution list below will be incorporated into the cultural survey plan, recordation, and design updates as needed. Your timely response will greatly help us incorporate your concerns into the development of the Project. For that purpose, we request that you provide comments by December 20, 2025.

Tribal consulting parties may respond to myself (Kevin Cole) at rougetroadsola@rwe.com with any comments or concerns. Alternatively, you can reach out directly to Gustavo Cordero at the MPSC at corderog@michigan.gov.

Respectfully,

Kevin Cole
RWE Development Manager
rougetroadsola@rwe.com

cc: Gustavo Cordero, Michigan Public Service Commission
Carol McKnight, SWCA Environmental Consultants
Anna Gilmer, SWCA Environmental Consultants

Distribution List:
Forest County Potawatomi Community, Wisconsin
Hannahville Indian Community, Michigan
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
Little Traverse Bay Bands of Odawa Indians, Michigan
Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan
Menominee Indian Tribe of Wisconsin
Miami Tribe of Oklahoma
Pokagon Band of Potawatomi Indians, Michigan and Indiana
Sault Ste. Marie Tribe of Chippewa Indians, Michigan
Seneca-Cayuga Nation

Enclosures:
1. Figures
    a. Figure 1: State location map
    b. Figure 2: Portions of the USGS 7.5' series Tecumseh South and Palmyra Michigan Topographic Quadrangles showing the Project area.
    c. Figure 3: Aerial view of the Project area location in Palmyra Township, Lenawee County, Michigan.
2. Cultural Desktop Report
3. SHPO PA233 Response

Figure 1. Location of the proposed Rouget Road Solar Project Area in Michigan.

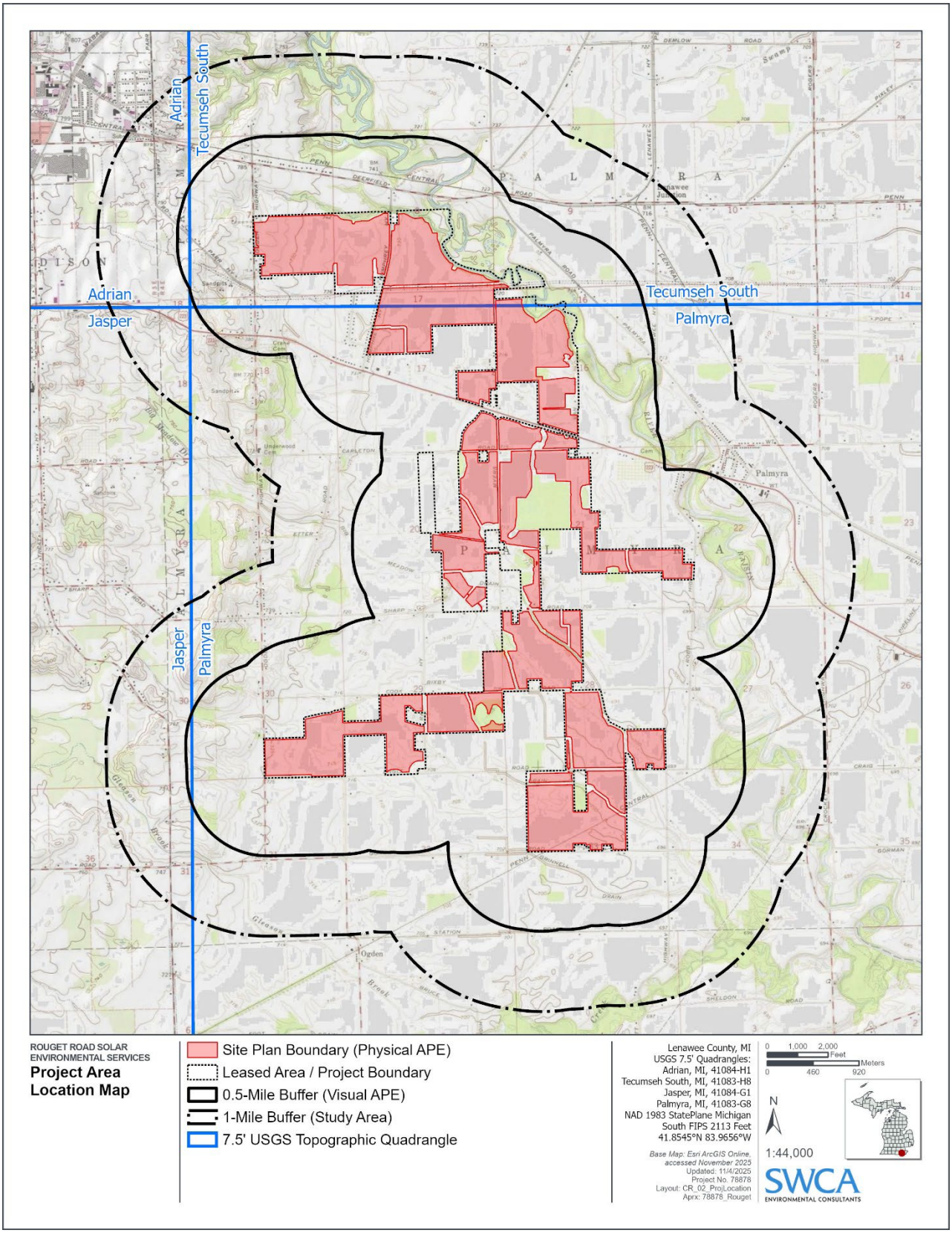

Figure 2. Portions of the USGS 7.5' series Tecumseh South and Palmyra, Michigan Topographic Quadrangles showing the site plan boundary and leased area/Project boundary.

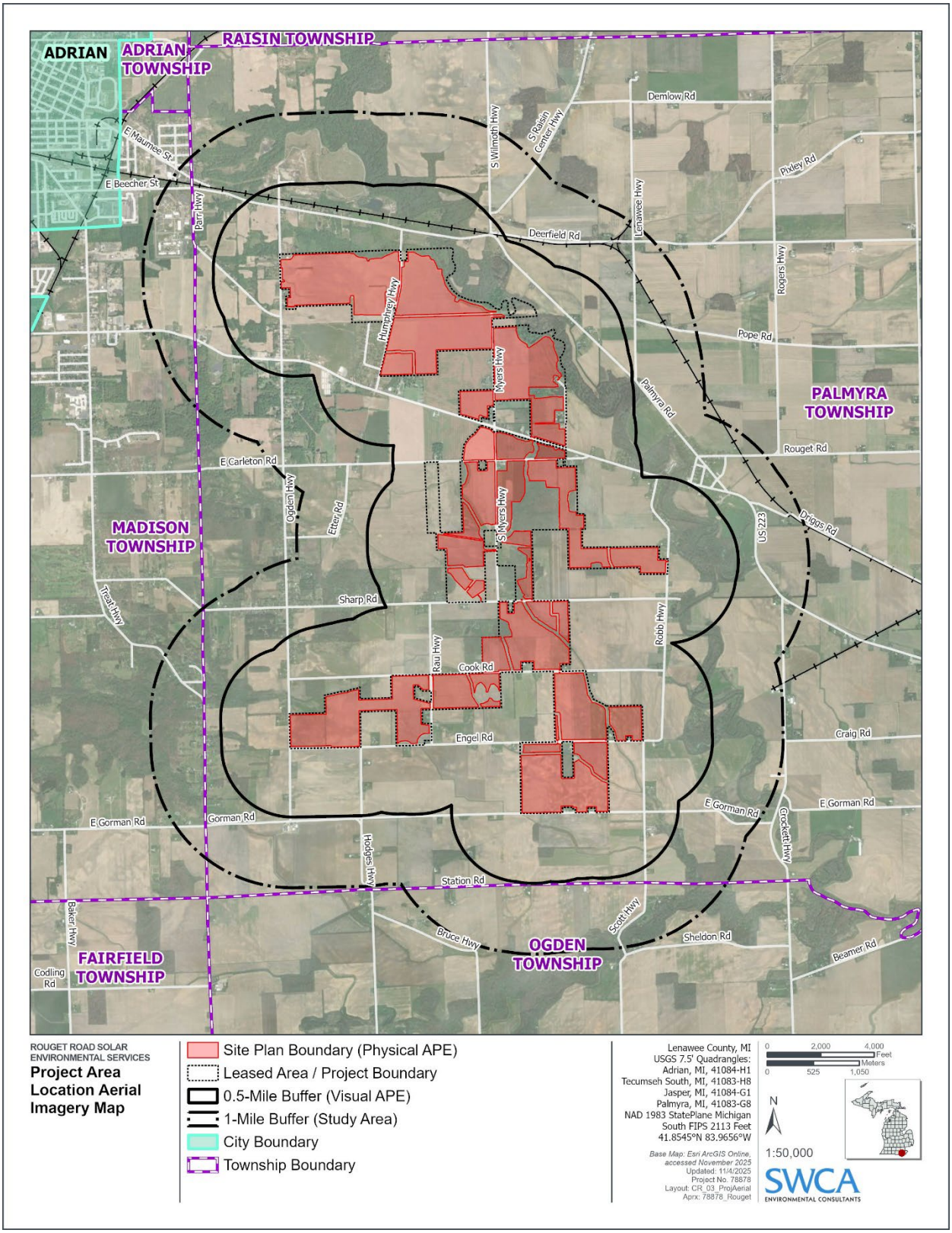

Figure 3. Aerial view showing the site plan boundary and leased area/Project boundary in Palmyra Township, Lenawee County, Michigan.

Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan

JANUARY 2025

PREPARED FOR

Rouget Road, LLC

PREPARED BY

SWCA Environmental Consultants

CULTURAL RESOURCES DESKTOP REVIEW FOR THE ROUGET ROAD, LLC LENAWEE COUNTY, MICHIGAN

Prepared for

Rouget Road, LLC
353 North Clark Street, 30th Floor
Chicago, Illinois 60654
Attn: J Kevin Cole

Prepared by

Rachel Lawrence, M.A., RPA
Heather MacIsaac, B.A.

and

Anna Gilmer, M.A., RPA

SWCA Environmental Consultants
200 22nd Street, Suite 220
Lombard, Illinois 60148
(630) 705-1762
www.swca.com

SWCA Project No. 78878

SWCA Cultural Resources Report No. 25-27

January 2025

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1 INTRODUCTION

SWCA Environmental Consultants (SWCA) completed a cultural resources desktop review for the proposed Rouget Road, LLC (project), located in Lenawee County, Michigan (Figure A-1 in Appendix A). The Project Area spans approximately 2,490 acres (1,008 hectares) of privately owned land near the towns of Adrian, Palmyra, and Ogden. SWCA completed the desktop review for the Project Area plus a surrounding 1.0-mile (1.6-kilometer) buffer around the Project Area. The surrounding 1.0-mile buffer is henceforth referred to as the Study Area (Figures A-2 and A-3).

The objective of the desktop review was to identify existing cultural resources within the Project Area and Study Area to inform project facility siting. Additionally, the Study Area was evaluated to gain an understanding of the type and density of cultural resources in the vicinity of the Project Area. This report summarizes the methods SWCA used to complete the desktop review and presents the results of the background research. It does not serve as Section 106 clearance for the proposed project.

2 REGULATORY FRAMEWORK

Projects in Michigan can come under the purview of two primary cultural resources regulations, the National Historic Preservation Act (NHPA) and Michigan's Natural Resources and Environmental Protection Act. Both are administered by the Michigan State Historic Preservation Office (MI SHPO).

If the project is deemed a federal undertaking (requiring a federal permit, license, or approval; being located on federally owned or managed land; or receiving federal financial assistance), a cultural resources survey most likely would be mandated to ensure compliance with Section 106 of the NHPA. The scope of required cultural resources surveys would then be determined by the functioning federal lead agency in cooperation with the MI SHPO and, if applicable, the pertinent Tribal Historic Preservation Offices as defined in both Section 101 of the National Environmental Policy Act and Section 106 of the NHPA.

Under Michigan law, the state oversees all archaeology performed on state land. The Natural Resources and Environmental Protection Act (Public Act 451 of 1994, Part 761) requires that a permit be obtained prior to undertaking any archaeological investigation on state land.

Public Act 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 megawatts or more, to wind projects with a capacity of 100 megawatts or more, and to energy storage facilities with a capacity of 50 megawatts or more. Public Act 233allows developers the option of applying to the Michigan Public Service Commission (MPSC) to construct utility-scale renewable energy facilities if the local unit of government does not have a compatible renewable energy ordinance. If a compatible renewable energy ordinance is in place, the developer must apply with the local unit of government first, but if the project is denied, the developer may submit to the MPSC for approval. Projects that fall into these categories must identify and provide information on the effects of the project on environmental, natural, and cultural resources.

The project will occur solely on privately held land; thus, no state or local laws requiring archaeological investigations or surveys are anticipated to apply for this project. However, Public Act 233 requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC.

3 METHODOLOGY

SWCA initially submitted a request for in-person research to the MI SHPO on April 7, 2023. Staff at the MI SHPO approved the request and scheduled a research appointment for April 20, 2023. An SWCA archaeologist obtained information in person on previous cultural resources surveys, previously recorded archaeological resources, and previously recorded postcontact architectural resources within the Study Area.

As the Project Area and Study Area were revised in fall 2024, SWCA submitted a second request to the MI SHPO for archaeology and survey site files within the revised Study Area. MI SHPO provided all available records on December 9, 2024. Due to the ongoing updates to the MI SHPO's database, a process that was initiated on February 24, 2024, only archaeology files are currently available. Postcontact architecture files and both postcontact architectural and archaeological survey reports are not currently available as the MI SHPO are scanning these files for upload into a new database. As such, SWCA relied on the April 2023 postcontact architectural resource files and survey reports for this review. SWCA additionally reviewed the National Register of Historic Places (NRHP) database for Michigan as the best available recent data regarding architectural resources.

In addition to the site file search, SWCA investigated historic plat and topographic maps and historic aerial imagery of the Project Area and Study Area. SWCA also researched environmental factors such as modern and historic land use and soil units mapped by the Natural Resources Conservation Service (NRCS) to determine the likelihood of the project to encounter previously unrecorded precontact or postcontact archaeological resources.

4 RESULTS

4.1 Physiography, Geology, and Soils

The Project Area is situated within the Erie-Huron Lake Plain of the Eastern Lake section of the Central Lowland province of the Interior Plains (NRCS 2022:343). The Erie-Huron Lake Plain is a fairly level glacial lake plain with scattered sandy ridges formed by former shorelines and moraines. Elevation ranges from approximately 570 to 815 feet (175 to 250 meters [m]), whereas local relief averages 10 feet (3 m). Major confluences in the Erie-Huron Lake Plain include the Clinton, Huron, and Saginaw Rivers, which empty into the Great Lakes. The Project Area is located within the Floodwood Creek-River Raisin watershed and the Big Meadow Drain-Black Creek watershed, which empty into the River Raisin (U.S. Environmental Protection Agency 2023). Mississippian- to Silurian-age limestone, shale, and dolomite are common along the surface and along the shores of Lake Erie and Lake Huron. Broad, level, and somewhat poorly drained lake plains feature American beech, sugar maple, silver maple, green ash, pin oak, swamp white oak, and American elm, whereas sandy areas feature eastern white pine, eastern hemlock, and other coniferous trees (NRCS 2022:344).

This ecoregion is also part of the Maumee Lake Plain and the Ann Arbor Moraines sub-subsections. The Maumee Lake Plain is a broad, flat, glaciated clay lake plain with rich, loamy soils deeply mantled by till and outwash and dissected by broad glacial drainageways containing sandy soils (Albert 1995). This region formerly included beech-sugar maple forest, elm-ash forest, deciduous swamps, white oak-black oak savannas, wet prairies, and coastal marshes, but now has been largely cultivated (Albert 1995; NRCS 2022). The Ann Arbor Moraines sub-subsection is a long, narrow band of fine- and medium-textured end and ground moraine bordered by flat lake plain on the east and by sandy outwash, end moraine, and ice-contact features to the west. This region formerly supported oak and oak-hickory forests, with oak

savannas along the western edge (Albert 1995). Major wildlife species in the Erie-Huron Lake Plain area include white-tailed deer; cottontail rabbits; squirrels; raccoons; pheasants; bobwhite quail; songbirds; various species of snakes, frogs, and turtles; sunfish; perch; bass; walleye; catfish; carp, sucker; and northern pike.

There are 40 soil series mapped within the Project Area by the NRCS (Table 1). The soils range from very poorly drained to excessively drained loams to sandy loams. The most common soils for the Project Area include Brady and Macomb loams, 0 to 3 percent slopes; Colwood very fine sandy loam, 0 to 3 percent slopes; Wauseon loam, 0 to 3 percent slopes; Ziegenfuss clay loam, 0 to 1 percent slopes; Brady and Macomb sandy loams, 0 to 3 percent slopes; and Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes. These soil types, and their implication for site formation processes and archaeological potential, are discussed further in Section 4.6.

Table 1. Soils within the Project Area

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
BbA	Berrien loamy sand, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BbB	Berrien loamy sand, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcA	Berrien sandy loam, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcB	Berrien sandy loam, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BhA	Brady sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on strand plains	Loamy over sandy and gravelly glaciofluvial deposits
BkA	Brady and Macomb loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BnA	Bronson sandy loam, 0 to 3 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BnB	Bronson sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BoA	Brookston loam, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
CbB	Cadmus sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over loamy till
CeA	Colwood very fine sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CgA	Conover loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Loamy till
GbA	Genesee sandy loam, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
GcA	Genesee and Eel loams, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GgA	Griffin and Sloan loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Clayey till
KbC	Kendallville sandy loam, 7 to 15 percent slopes	Well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over till
KeA	Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on deltas	Stratified loamy glaciofluvial deposits
LcA	Linwood muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Wood organic material over loamy till
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Drainageways on till-floored lake plains	Sandy and/or loamy glaciofluvial deposits over loamy till
NaA	Nappanee silt loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Clayey till
NbB	Nappanee loam, 3 to 7 percent slopes	Somewhat poorly drained	Knolls on ground moraines	Clayey till
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	Somewhat poorly drained	Knolls on ground moraines	Clayey till
OcC	Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded	Excessively drained	Beaches on till-floored lake plains	Glaciofluvial deposits and/or sandy glaciolacustrine deposits over loamy till
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	Poorly drained	Depressions on till plains	Loamy till
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PdB	Plainfield and Berrien loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PeB	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PwmaaA	Pewamo clay loam, dense substratum, 0 to 1 percent slopes	Poorly drained	Drainageways on nearshore zones (relict), flats on nearshore zones (relict)	Clayey till over dense till
RbA	Rollin muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Herbaceous organic material over marl
SbA	Sebewa sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on glacial drainage channels	Loamy over sandy and gravelly glaciofluvial deposits
Sf	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	Poorly drained	Drainageways on stream terraces, drainageways	Loamy drift over sandy and gravelly outwash
WcA	Wauseon loam, 0 to 3 percent slopes	Poorly drained	Depressions on till-floored lake plains	Glaciolacustrine deposits over clayey till

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	Poorly drained	Wave-worked till plains	Clayey till over loamy till
W	Water	N/A	N/A	N/A

Source: NRCS (2024).

4.2 Historical Land Use

SWCA reviewed historic plat and topographic maps, as these sources provide information on past land use within the Project Area and Study Area that may indicate the probability of encountering significant precontact and postcontact cultural resources in or near the Project Area. The historic maps indicate that there has been a general consistency in the road network and land-use patterns from the late nineteenth century into the modern era in the Study Area.

The earliest available map of the Project Area is an 1819 General Land Office survey map (Bureau of Land Management General Land Office 2024). The Project Area is uninhabited. The River Raisin is drawn as a winding water course east of the Project Area. There are patches of marshlands, and tributaries are marked but not fully drawn. No structures are depicted. Palmyra and Lenawee Junction have not yet been established.

The first available plat map, dated 1874, shows that the Project Area and Study Area had been divided into large landholdings. Residences, schools, and churches are depicted. Roads and three railroads also are in place, including the Lenawee County Railroad and Palmyra Road. The current U.S. Highway 233 is shown as a railroad. Several structures are depicted on landholdings within the Project Area. Some of these structures are adjacent to orchards or small agricultural fields. There are branches of unnamed tributaries flowing throughout the Project Area, one of which is the modern Big Meadow Drain (Everts and Stewart 1874).

By 1893, the Project Area is depicted similarly to the 1874 plat. More landowners have appeared, represented by smaller landholdings, and structures are depicted within the Project Area. The unnamed tributaries are still depicted, running through the central and southern portions of the Project Area (Cadwell 1893).

The 1916 plat map shows an increase in landowners once more as the communities of Lenawee Junction and Palmyra continue to grow. Structures also are depicted on these parcels in the Project Area and are shown mostly along roads. U.S. Highway 233 is depicted as the Toledo Western electric railroad. There is another railroad that runs north-south to the Toledo Western electric railroad, connecting from Adrian to Palmyra within the Project Area. This segment of rail had been a road on the 1874 and 1893 plat maps. Several tributaries also are shown within the Project Area (Ogle 1916).

The 1921 plat map does not show individual structures beyond churches and schools, neither of which are in the Project Area. Landowner names are given, and the road network and railroads appear in the same location as on previous plats (*Adrian Daily Telegram* 1921). The 1928 plat presents the same information (*Adrian Daily Telegram* 1928).

SWCA also reviewed historic topographic maps to determine the land use of the Project Area and Study Area. Four historic topographic maps from 1939 to 1972 show that there has been little development from the early twentieth century to the present (U.S. Geological Survey [USGS] 2024). On the earliest available topographic map (Blissfield, Michigan, 1939, 1958 edition), multiple structures are shown in the

Project Area along roadways. The tributaries shown on the plat maps are named and shown: Big Meadow Drain, Bixby Drain, and Grinnell Drain. The road network and railroads are also depicted. The 1941 Blissfield, Michigan, topographic map reveals a similar image. The 1972 Palmyra, Michigan, and 1972 Tecumseh South, Michigan, topographic quadrangles name most of the roads in the Project Area, and they show that residential development had not increased outside of Palmyra and Adrian. Transmission and telecommunication cables are also depicted (USGS 2024).

A review of 17 aerial photographs taken between 1955 and 2022 indicates that minimal land development occurred within the Project Area and its environs. On the aerial images beginning in 1955, the landscape is agricultural. Isolated farmsteads are visible along roadways outside of Palmyra, Lenawee Junction, and Adrian. Drainages are visible either as scars on the landscape or are lined with trees, as is the River Raisin. There are some stands of trees throughout the Project Area. Between 1955 and 2022, no noticeable changes occur to the land use in the Project Area or Study Area (Historic Aerials 2024).

4.3 Previous Cultural Resources Surveys

A review of MI SHPO records identified one cultural resources survey that was conducted in the Project Area and two cultural resources surveys conducted within the Study Area (Table 2). Project ER00-7.17.161134 was a reconnaissance investigation conducted in 2017 by Archaeological Consultants of Ossian. The survey area covered 0.44 acre of land, and no cultural resources were identified during the survey (Stillwell 2017). Project ER17-391 was conducted for the Howard Street/West Michigan CMAQ and Rehabilitation project; however, the MI SHPO records did not contain information on the surveyors, year, or report title. Project B17-258, identified on quad maps in the MI SHPO research repository as Lauterbur 2016, was a Phase I archaeological survey conducted in support of the replacement of the River Raisin Bridge in Palmyra, Michigan. The MI SHPO records did not include information on the extent of the survey; however, no archaeological sites were identified during the survey.

Table 2. Previous Cultural Resources Surveys in the Study Area

Project ID	Project Name	Survey Year	Surveyors	Report Title	Location
ER00-7.17.161134	G2 Cellular Tower Site Review #161134	2017	Archaeological Consultants of Ossian	*An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project #161134) in Palmyra, Lenawee Conty, Michigan. 17FR29Mi.*	Project Area
ER17-391	Howard Street/ West Michigan CMAQ and Rehabilitation	None recorded	None recorded	None recorded	Study Area
B17-258	Lauterbur 2016	2016	Michigan Department of Transportation	*Archaeological Investigations at US-223 River Raisin Bridge Replacement, Palmyra, Lenawee County.*	Study Area

4.4 Previously Recorded Archaeological Sites

[redacted]

[redacted]

4.5 Previously Recorded Architectural Resources and Cemeteries

SWCA reviewed the National Park Service's NRHP database for Lenawee County, Michigan, regarding information on historic districts, buildings, archaeological sites, and other properties eligible for or listed in the NRHP. The NRHP database did not identify any NRHP-listed resources within the Project Area (National Park Service 2024).

SWCA also reviewed historic architecture data provided by the MI SHPO in April 2023. No previously recorded architectural resources are located within the Project Area; three architectural resources are located in the Study Area (Table 4; Appendix A: Figure 5).

No recorded cemeteries are present in the Project Area; two postcontact cemeteries (Palmyra Village Cemetery and Crane Cemetery) are located within the Study Area (Table 5; Appendix A: Figure 5). Palmyra Village Cemetery was included in the MI SHPO site file data, while Crane Cemetery was identified through archival research of historic topographic maps. Due to the data gap in the MI SHPO site file records since February 2024, it is not clear if Crane Cemetery is still absent from MI SHPO site file records.

Table 4. Previously Recorded Historic Architectural Resources in the Study Area

Site ID	Historic Name	City	NRHP Status	Location
P23943	Palmyra Presbyterian Church	Palmyra	Unevaluated	Study Area
P61449	Bruce Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area
P61451	Scott Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area

Table 5. Previously Recorded Cemeteries in the Study Area

Historic Name	Record Source	Location
Palmyra Village Cemetery	MI SHPO site file data	Study Area
Crane Cemetery	Archival research	Study Area

4.6 Geoarchaeology

Geoarchaeology, which is a multidisciplinary field that incorporates topography, geomorphology, geology, and soils, helps archaeologists to understand how geological processes have influenced the preservation of archaeological sites. Research conducted by Monaghan and Lovis (2005) demonstrates that deeply buried soils have an increased probability of sustaining cultural resources where fluvial deposits overlie alluvial deposits as a result of waterways breaching their banks. Monaghan and Lovis developed a predictive geoarchaeological model that takes these effects into account and classifies an area's likelihood of having cultural resources from Low to High-Very High.

Based on the Monaghan and Lovis (2005) model, the Project Area intersects with areas modeled as having moderate to high potential for deeply buried archaeological deposits (Figure A-6). [redacted] Otherwise, the remainder of the Project Area is largely mapped as exhibiting a low potential for deeply buried archaeological deposits.

[redacted]

4.7 Cultural Resources Context and Potential

The potential of the Project Area to contain cultural resources was developed through examination of the natural and topographical characteristics of the Project Area and available historic-era maps and aerial photographs.

4.7.1 Potential for Precontact Archaeological Sites

[redacted]

4.7.2 Potential for Postcontact Archaeological Sites

[redacted]

5 SUMMARY AND RECOMMENDATIONS

In summary, the records review established that one cultural resources survey has been conducted previously within the Project Area, and two cultural resources surveys have been conducted in the Study Area. These compliance surveys were negative and did not result in the recordation of cultural resources within the Project Area or the Study Area. However, [redacted] None of the archaeological sites within the Project Area have been evaluated for listing in the NRHP. There are no previously recorded architectural resources within the Project Area and three architectural resources in the Study Area. Based on MI SHPO records and a review of the NRHP, there are no NRHP-listed resources located within the Project Area or Study Area.

There is an overall moderate probability for significant precontact archaeological sites and a low to moderate probability for significant postcontact archaeological sites within the Project Area. [redacted]

Should the project require archaeological survey, the geoarchaeological modeling (Monaghan and Lovis 2005) suggests that shovel testing and/or deep testing (e.g., auguring) may be necessary [redacted] Pedestrian survey is a viable survey methodology as long as alluvial soils are confined to the plow zone (e.g., 12 inches [30 centimeters]); the limits of shovel testing is typically 3 feet (1 m).

Based on the MPSC regulations and our communications with the MI SHPO (personal communication, Sarah Surface-Evans and Scott Slagor, January 30, 2025), SWCA recommends initiating consultation with the MI SHPO. SWCA understands that MI SHPO has initiated a new consultation process for projects subject to permitting through the MPSC, and that the MI SHPO will provide expert testimony regarding cultural resources to the MPSC. To initiate the consultation process, the MI SHPO requests developers to complete a consultation application, in coordination with a professional archaeologist and architectural historian, The MI SHPO will provide their recommendations for next steps, including survey and avoidance requirements. SWCA understands that RWE will have 1 year after submittal of the MPSC permit application to obtain the approval of survey reports or recommendations submitted to the SHPO.

In keeping with Public Act 233, which requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC, SWCA recommends this document be provided to the MPSC for review. Approval from the MPSC is required before development within the boundaries of these sites occurs.

6 REFERENCES CITED

Adrian Daily Telegram. 1921. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21190/Palmyra+Township/Lenawee+County+1921/Michigan/. Accessed November 14, 2024.

———. 1928. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/1610467/Palmyra+Township++Raisin+River/. Accessed November 14, 2024.

Albert, Dennis A. 1995. Regional landscape ecosystems of Michigan, Minnesota and Wisconsin: A working map and classification. General Technical Report NC-178. U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota. Available at: https://www.nrs.fs.usda.gov/pubs/gtr/other/gtr-nc178/index.html. Accessed November 1, 2024.

Bureau of Land Management General Land Office. 2024. Original Survey Plat, Township 7 North, Range 4 East, 3rd Principal Meridian. Available at: https://glorecords.blm.gov/details/survey/default.aspx?dm_id=27676&sid=usa5y3jo.a4o#surveyDetailsTabIndex=0. Accessed November 14, 2024.

Cadwell, George D. 1893. Atlas of Lenawee County, Michigan. Geo. D. Cadwell and Company, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21077/Palmyra+Township/Lenawee+County+1893/Michigan/. Accessed November 14, 2024.

Everts and Stewart. 1874. Combination Atlas Map of Lenawee County, Michigan. Everts and Stewart, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/20906/Palmyra+Township/. Accessed November 14, 2024.

Historic Aerials. 2024. Historic Aerials Viewer. Available at: https://www.historicaerials.com/viewer. Accessed November 14, 2024.

Monaghan, G. William, and William A. Lovis. 2005. *Modeling Archaeological Site Burial in Southern Michigan: A Geoarchaeological Synthesis*. Michigan State University Press, East Lansing.

National Park Service. 2024. National Register of Historic Places Database and Research. Available at: https://www.nps.gov/subjects/nationalregister/database-research.htm. Accessed January 13, 2025.

Natural Resources Conservation Service (NRCS). 2022. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. Washington, D.C.

———. 2024. Custom Soil Report. Available at: http://websoilsurvey.nrcs.usda.gov. Accessed December 12, 2024.

Ogle, George A. 1916. Standards Atlas of Lenawee County, Michigan. Geo. A. Ogle Publishers and Engravers, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/22243/Palmyra+Township/Lenawee+County+1916/Michigan/. Accessed November 14, 2024.

Stillwell, Larry N. 2017. *An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project No. 161134) in Palmyra, Lenawee County, Michigan*. Archaeological Consultants of Ossian. On file at the Michigan State Historic Preservation Office, Lansing, Michigan.

U.S. Environmental Protection Agency. 2023. How's My Waterway Viewer. Available at: https://mywaterway.epa.gov/. Accessed November 14, 2024.

U.S. Geological Survey (USGS). 2024. National Geologic Map Database Project TopoView. Available at: https://ngmdb.usgs.gov/topoview/viewer/#14/41.8731/-83.9695. Accessed November 14, 2024.

APPENDIX A

Figures

Figure A-1. Location of the proposed Rouget Road, LLC Area in Michigan.

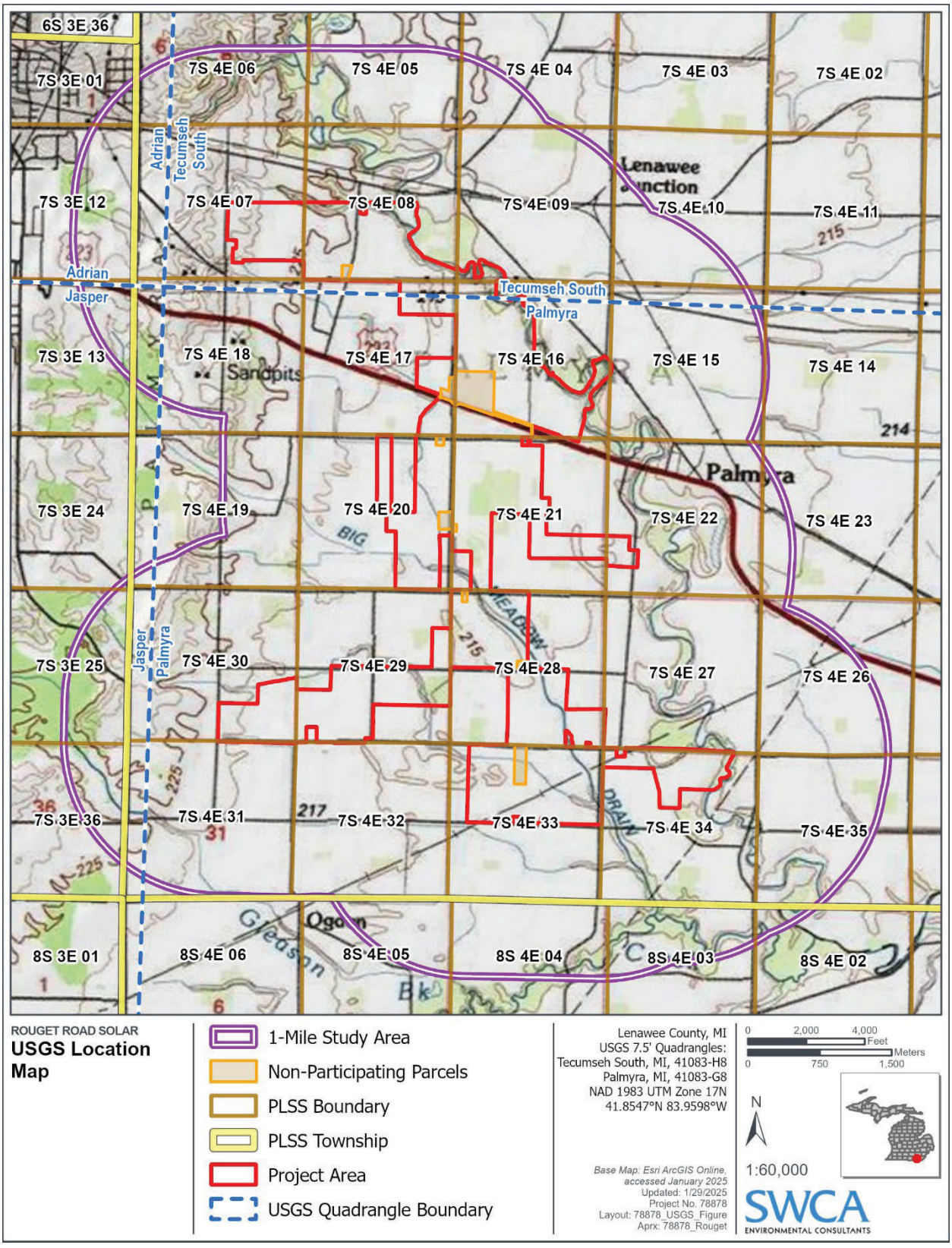

Figure A-2. Location of the Study Area for the proposed Rouget Road, LLC on a USGS topographic map.

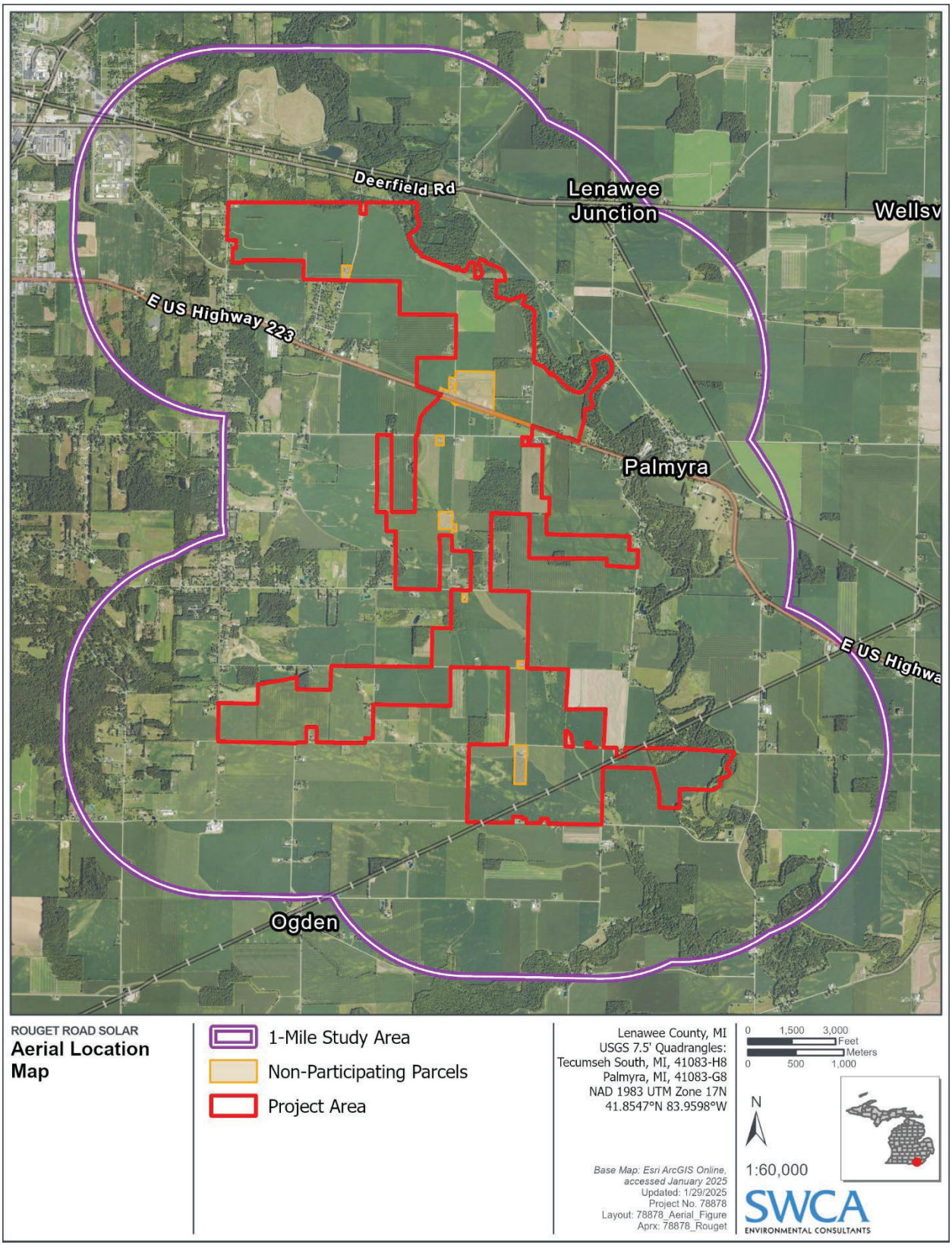

Figure A-3. Overview of the Study Area for the proposed Rouget Road, LLC on aerial imagery.

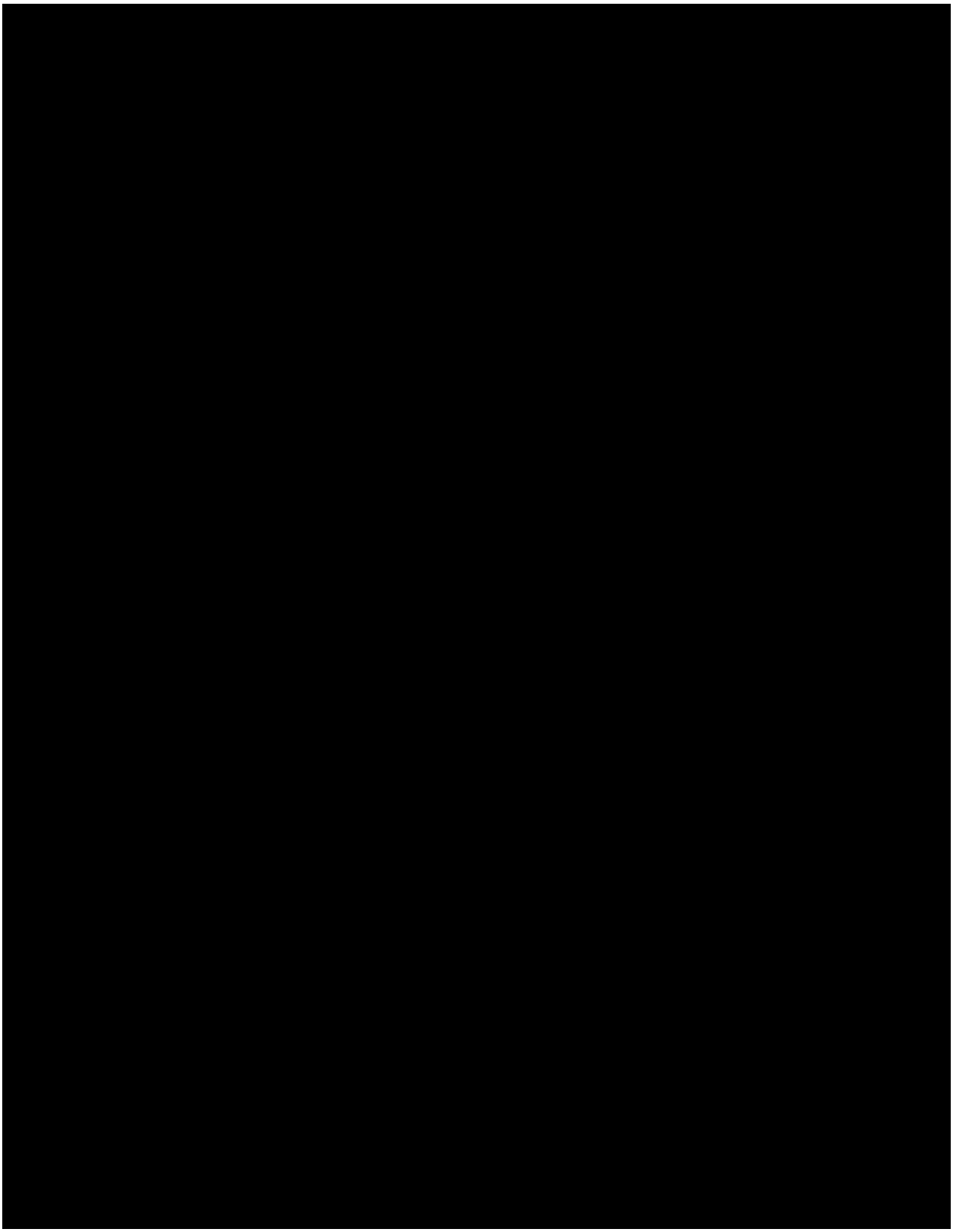

Figure A-4. Results of the background research for previously recorded cultural resources and previously conducted surveys.

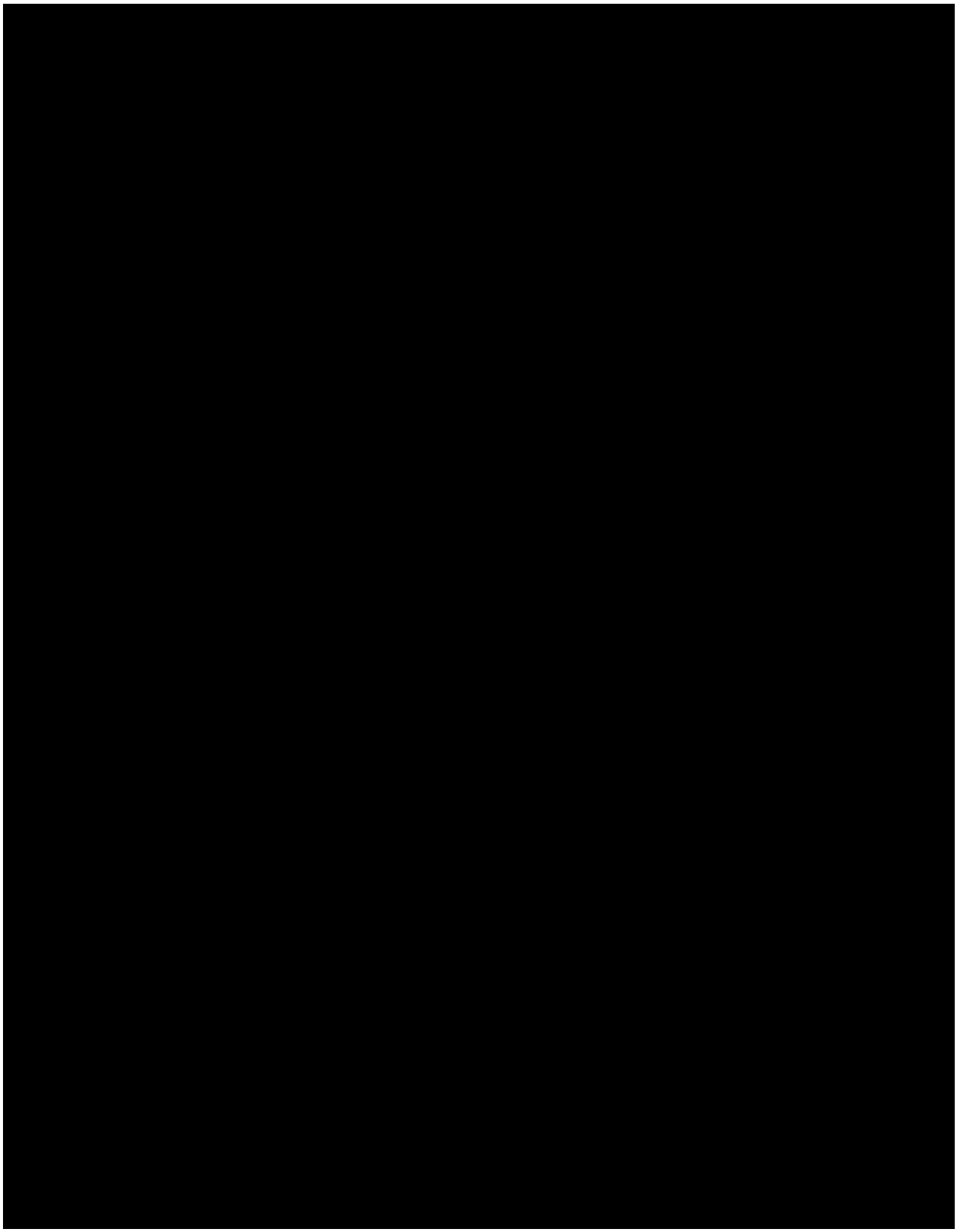

Figure A-5. Results of the background research for postcontact architectural resources and cemeteries.

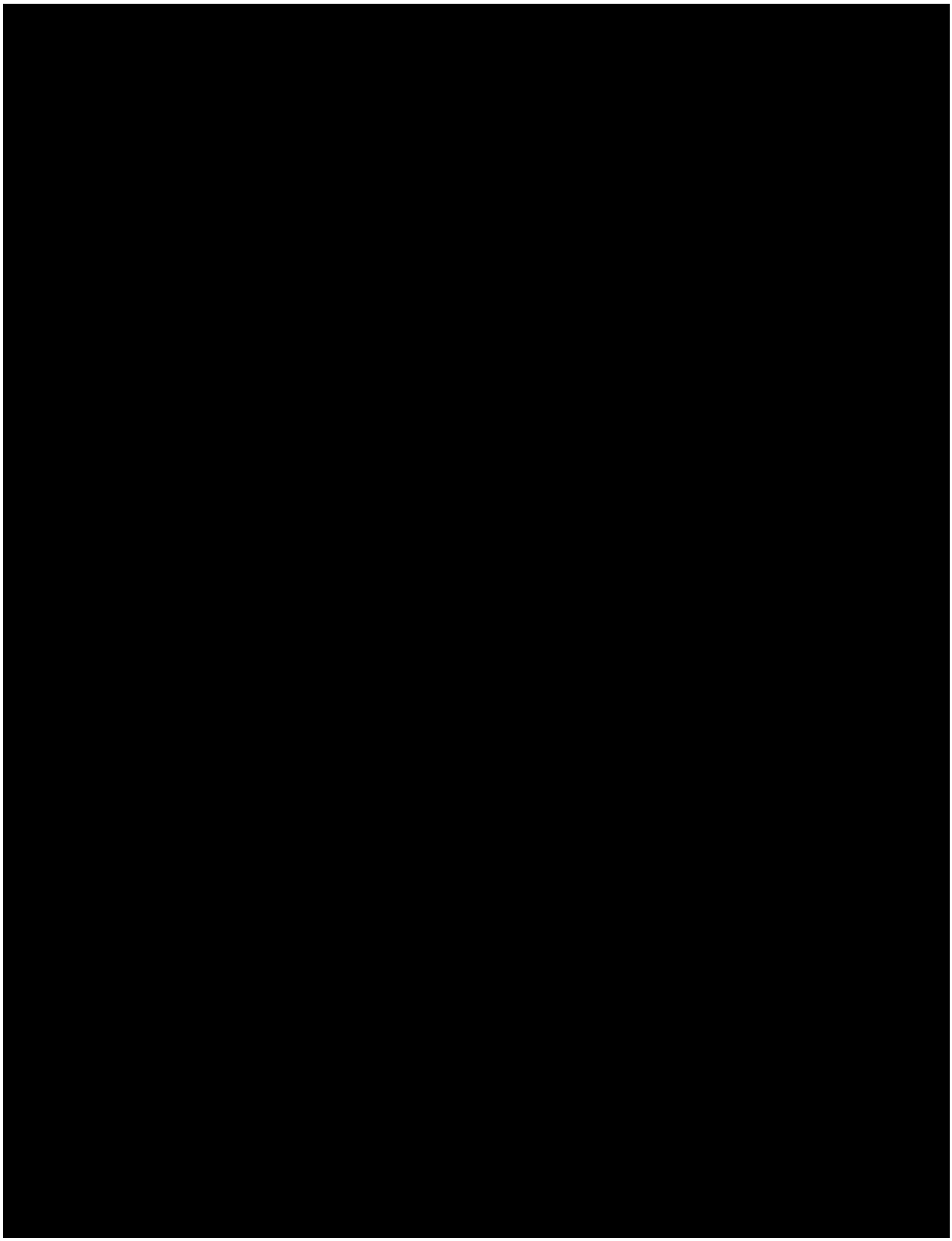

Figure A-6. Areas modeled as having moderate to high potential for deeply buried archaeological deposits in the Project Area and Study Area.

GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
MICHIGAN STRATEGIC FUND
STATE HISTORIC PRESERVATION OFFICE

QUENTIN L. MESSER, JR.
PRESIDENT

September 10, 2025

KEVIN COLE
ROUGET ROAD LLC
10250 PENLAWN DR.
JEROME, MI 49249

RE: SR25-23 PA233 Review Rouget Road, LLC Solar, T07S/R04E/Sec. 7, 8, 9, 15, 16, 17, 20 ,21, 22, 27, 28, 29, 30, 33, and 34, Palmyra Township, Lenawee County (MPSC)

Dear Mr. Cole:

We have received your request for review of the above-cited project under Public Act 233 of 2023 for Renewable Energy and Energy Storage Facility Siting (PA 233) at the above-noted location. We have reviewed the assessment prepared by SWCA, "Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan" and appreciate the information provided. To fully consider and address impacts to cultural and historic sites we require additional information, please send the following:

General

In the materials submitted, the project area boundaries in the submission form and in the Desktop Review do not match. Please ensure that we have the final project boundary maps included in all materials submitted to our office. Desktop Review states that the project plan will avoid archaeological sites, however, the project mapping provided does not make this apparent or clear. We cannot assess the impact of the proposed project on historic resources without accurate mapping information. Additionally, we would like to see the locations of staging areas, vehicle traffic, and any other areas that may have ground disturbance mapped.

Archaeological Resources

Due to the presence of previously documented sites within and near the project area, and the high archaeological sensitivity for the River Raisin valley generally, SHPO requests full archaeological survey for the entire project area, including staging areas. In particular, the boundaries of site 20LE28 are poorly delineated. In order to avoid this site, which is known to contain burials, additional survey methodologies may be necessary beyond pedestrian survey or shovel testing***. SHPO recommends consulting with our office and Tribal Nations with historic connections to this region to develop an appropriate methodology***, which may include geophysical prospection or historic human remains detection dog (HRD) survey. SHPO also recommends developing an Unanticipated Discovery Plan (UDP) for the project. A UDP specifies who will be contacted and what measures will be taken in the event of an unanticipated discovery of archaeological materials or human remains during the project implementation. Please see the UDP template attached, for an example of how these documents are organized. SHPO encourages the project proponent to work with consulting party tribes to develop an

appropriate UDP and protocol for handling human remains.

Above-ground Resources

SHPO concurs with the proposed methodology of utilizing the Above Ground Table in lieu of identification forms except that we require identification forms for properties that are identified as eligible. The table does not provide enough information for eligible properties. For eligible properties, photographs of all resources must also be included in an attachment with Architectural Properties Identification Form. When discussing effects to above-ground resources, please be sure to provide discussion of visual impacts as well as visual barriers in place that may play in to effects determinations. Also be sure that the Historic Resource Survey Report contains enough history and contextual information about the area and resources for SHPO to adequately assess eligibility.

Additional information must be submitted online through our Additional Information Portal.

Please note that our review cannot proceed until we are able to consider the information requested above. This letter is not concurrence. If you have any questions, please contact please contact Senior Archaeologist, Sarah Surface-Evans, surfaceevanss1@michigan.gov, (517) 282-7959 or Historian, Katlyn Burns Yancho, at 517-256-3416, burnsyanchok@michigan.gov. **Please reference our project number in all communication with this office regarding this review.** Thank you for your consultation.

Sincerely,

Sarah Surface-Evans, PhD, RPA
Senior Archaeologist

SES:KAK:KBY:SSE

Enclosure(s): UDP Template

Copy: Anna Gilmer, SWCA

Grand Traverse Band of Ottawa & Chippewa Indians

From:	Jonathan Libbon
To:	"Aaron.Chivis@gtb-nsn.gov"
Cc:	Carol Mcknight; Aleyda Galan; Cole, J Kevin; Quarles, Mark
Subject:	Rouget Road Solar Consultation Letter
Date:	Thursday, November 20, 2025 5:02:00 PM
Attachments:	Rouget Tribal Consulation LTR_20Nov2025.pdf image001.png
Sensitivity:	Private

Good Afternoon Aaron,

On behalf of Rouget Road Solar Farm LLC, a wholly-owned subsidiary of RWE Clean Energy LLC (RWE), we are reaching out to request your input on the Rouget Road Solar Farm Project, a proposed solar facility in Lenawee County, Michigan. The facility will require a state siting certificate from the Michigan Public Service Commission (MPSC). The attached letter and documentation outline the project and provide details on the cultural resource work completed to date. We are seeking comments from your area of expertise regarding any potential environmental or cultural effects associated with this project.

Please let me or Kevin Cole (cc'd), the project manager from RWE, know if you have any questions about the project.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

The contents of this email and any associated emails, information, and attachments are CONFIDENTIAL. Use or disclosure without sender's authorization is prohibited. If you are not an authorized recipient, please notify the sender and then immediately delete the email and any attachments.

11/20/2025

Dear Tribal Historic Preservation Officer and/or Tribal Cultural Representative,

As part of its responsibilities under Michigan Public Act 233 of 2023 (PA 233), *Renewable Energy and Energy Storage Facility Siting*, the Michigan Public Service Commission (MPSC) is seeking consultation (as required in PA 233 Section 224.1b[1]) and determining the area of potential effects ("APE") for the proposed project. Federally listed sovereign Nations with an interest in the state of Michigan are invited to review and comment on Rouget Road Solar Farm, LLC's (Rouget Road Solar Farm) (a wholly-owned subsidiary of RWE Clean Energy LLC [RWE]) proposed **Rouget Road Solar Farm Project** (the "Project"). The proposed Project will require a state-siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC (PA 233 Section 226.7b). Although Rouget Road Solar Farm requests a review and comment on the Project, the MPSC is the state agency and may be communicated with directly.

Based on Michigan State Historic Preservation Office (MI SHPO) guidance from their *Instructions for the Application for PA 233 Renewable Energy Storage Facility Siting Consultation Form*:

> "**Public Act 233** requires the applicant for energy siting and storage facilities to consider and address impacts *to the environment and natural resources, including, but not limited to, sensitive habitats and waterways, wetlands and floodplains, wildlife corridors, parks,* ***historic and cultural sites****, and threatened or endangered species*. The applicant must submit this information to the Michigan Public Service Commission (MPSC) for consideration in permitting the project. In order to facilitate considerations of historic and cultural sites (hereafter Historic Properties), the MPSC has required applicants to consult with the State Historic Preservation Office (SHPO)."

This letter is part of the early coordination phase of the environmental review process, requesting comments associated with this Project. We are requesting comments from your area of expertise regarding any possible environmental or cultural effects associated with this Project. Please provide any additional information you may have regarding potential cultural resources in the Project area so they may be accounted for during the environmental review of this Project. This information can be provided directly to RWE or the MPSC.

Project Description

The proposed Project is southeast of the city of Adrian, in Palmyra Township, Lenawee County, Michigan (Figure 1). Historic Mapping places the proposed Project area in Sections 7, 8, 9, 15, 16, 17, 20, 21, 22, 27, 28, 29, 30, 33, and 34 of Township 7 South, Range 4 East as seen on the enclosed USGS 7.5 series for Tecumseh South and Palmyra, Michigan Topographic Quadrangle map (Figure 2). Rouget Road Solar Farm is proposing to construct a 175-megawatt (MW) alternating current (AC) solar photovoltaic power generating facility. The leased area/Project area boundary includes approximately 2,142 acres (867 hectares) (Figures 2 and 3). Construction will require 1,513 acres (612 ha) of what is currently primarily agricultural land (see site plan boundary in Figure 1). Limited tree removal is planned across 7.96 acres (3.22 ha). Proposed work required for the Project includes construction of a switchyard, substations, access

[1] Sections refer to those found at: https://www.legislature.mi.gov/documents/2023-2024/publicact/htm/2023-PA-0233.htm

roads, fencing, MV electrical cabling, and solar panel structures. Construction may also include an operations and maintenance building.

Project Permitting
The proposed Project will require a siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC.

PA 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 MW or more, to wind projects with a capacity of 100 MW or more, and energy storage facilities with a capacity of 50 MW or more. Projects that fall into these categories must identify and provide information on the effects of the Project on environmental, natural, and cultural resources. Additional PA 233 information is available online at State Project Reviews | MiPlace[2], and a Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the MPSC is available online at Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the Michigan Public Service Commission. [3]

Cultural Resource Investigations
The APE is the area in which the proposed Project may cause alterations in the character or use of historic resources. As the site plan boundary includes all locations that may be impacted by ground disturbing activities related to the project undertaking, it is considered the physical APE (see Figure 1). The visual APE for assessing visual effects to historic-age resources is a 0.5-mile buffer from the boundaries of the Project area (e.g., leased area/project boundary) (see Figure 2). This boundary will be modified based on visual intrusions that may obscure the project.

Rouget Road Solar Farm has contracted SWCA Environmental Consultants (SWCA) to conduct the archaeological and architectural history surveys. Due to the presence of previously--documented archaeology sites in and near the Project area, and the archaeological sensitivity for the River Raisin Valley, SWCA will conduct a full archaeological survey for the physical APE, including staging areas. The boundaries of [redacted], is mapped as lying within the proposed Project area; however, these site boundaries are mapped based off archival records and the extent of the complex is poorly understood. In order to be sensitive toward this [redacted], we are asking for your input on the extent of the complex and the survey methodologies that may be necessary beyond [redacted] An Unanticipated Discoveries Plan (Exhibit A-1.14 in the MPSC permit application) has been prepared.

Summary of Requested Action
We look forward to consulting with your office on this Project and to a continued dialogue. We ask that you provide any comments regarding the Project area following your review of the enclosure. Please use the above Project name and Project description in your reply.

In summary, the MPSC and Rouget Road Solar Farm are requesting Tribal Governments to:

[2] https://www.miplace.org/historic-preservation/programs-and-services/cultural-resource-management-and-planning/state-project-reviews/

[3] https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/consumer/MPSC_Tribal_Involvement_Guide.pdf?rev=399582a67fbe46e883e6f21d1325e785&hash=AA471378E81539AFBBA758AB04FB3D25

1. Review the Project information.
2. Identify cultural or environmental concerns.
3. Provide feedback on archaeological methodologies (especially near site 20LE28).
4. Ensure that any cultural resources are addressed in the MPSC permitting process.

All comments will be documented and considered in Project design and the forthcoming MPSC state siting process. Consultation with SHPO and the THPOs included in the distribution list below will be incorporated into the cultural survey plan, recordation, and design updates as needed. Your timely response will greatly help us incorporate your concerns into the development of the Project. For that purpose, we request that you provide comments by December 20, 2025.

Tribal consulting parties may respond to myself (Kevin Cole) at rougetroadsola@rwe.com with any comments or concerns. Alternatively, you can reach out directly to Gustavo Cordero at the MPSC at corderog@michigan.gov.

Respectfully,

Kevin Cole
RWE Development Manager
rougetroadsola@rwe.com

cc: Gustavo Cordero, Michigan Public Service Commission
Carol McKnight, SWCA Environmental Consultants
Anna Gilmer, SWCA Environmental Consultants

Distribution List:
Forest County Potawatomi Community, Wisconsin
Hannahville Indian Community, Michigan
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
Little Traverse Bay Bands of Odawa Indians, Michigan
Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan
Menominee Indian Tribe of Wisconsin
Miami Tribe of Oklahoma
Pokagon Band of Potawatomi Indians, Michigan and Indiana
Sault Ste. Marie Tribe of Chippewa Indians, Michigan
Seneca-Cayuga Nation

Enclosures:
1. Figures
    a. Figure 1: State location map
    b. Figure 2: Portions of the USGS 7.5' series Tecumseh South and Palmyra Michigan Topographic Quadrangles showing the Project area.
    c. Figure 3: Aerial view of the Project area location in Palmyra Township, Lenawee County, Michigan.
2. Cultural Desktop Report
3. SHPO PA233 Response

Figure 1. Location of the proposed Rouget Road Solar Project Area in Michigan.

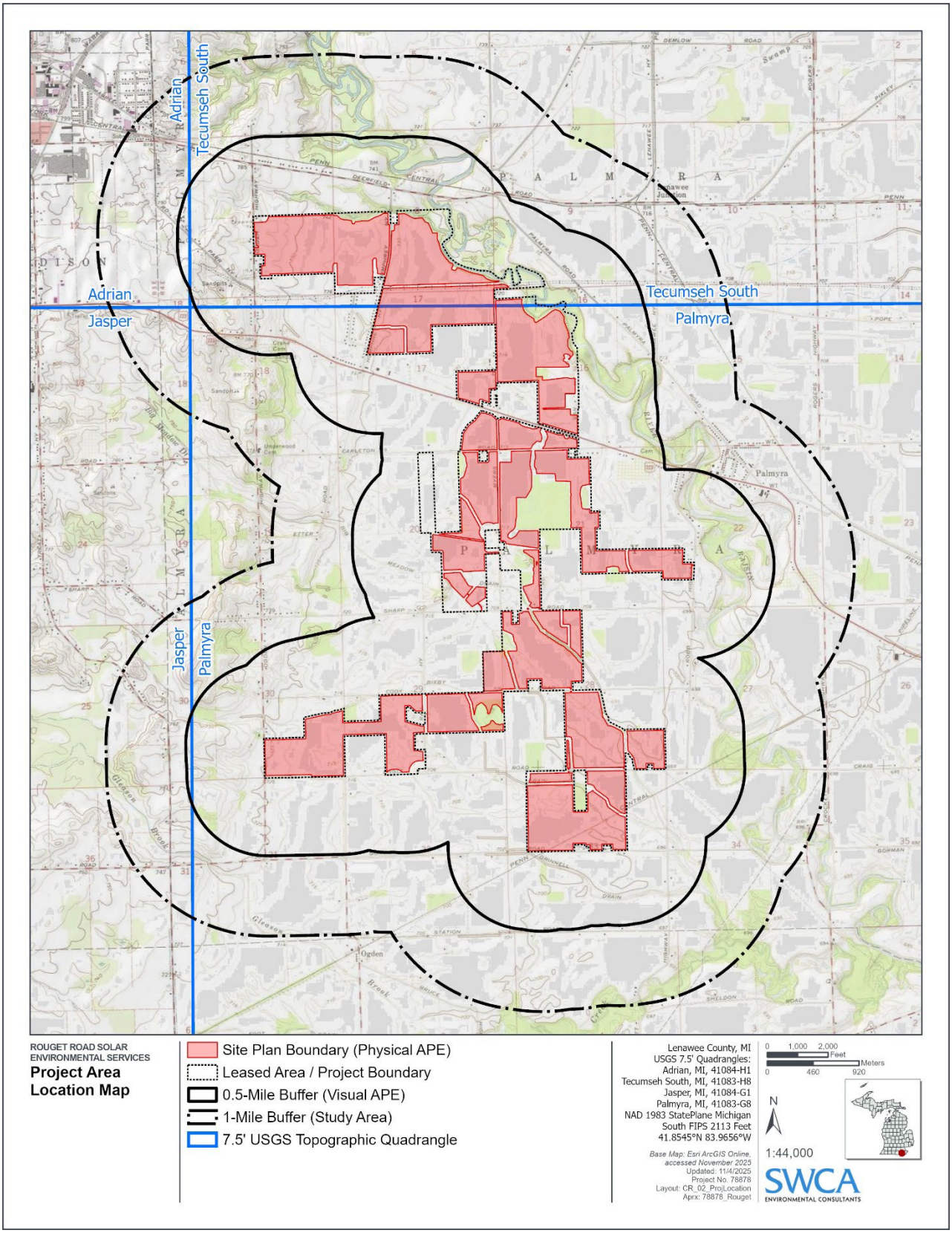

Figure 2. Portions of the USGS 7.5' series Tecumseh South and Palmyra, Michigan Topographic Quadrangles showing the site plan boundary and leased area/Project boundary.

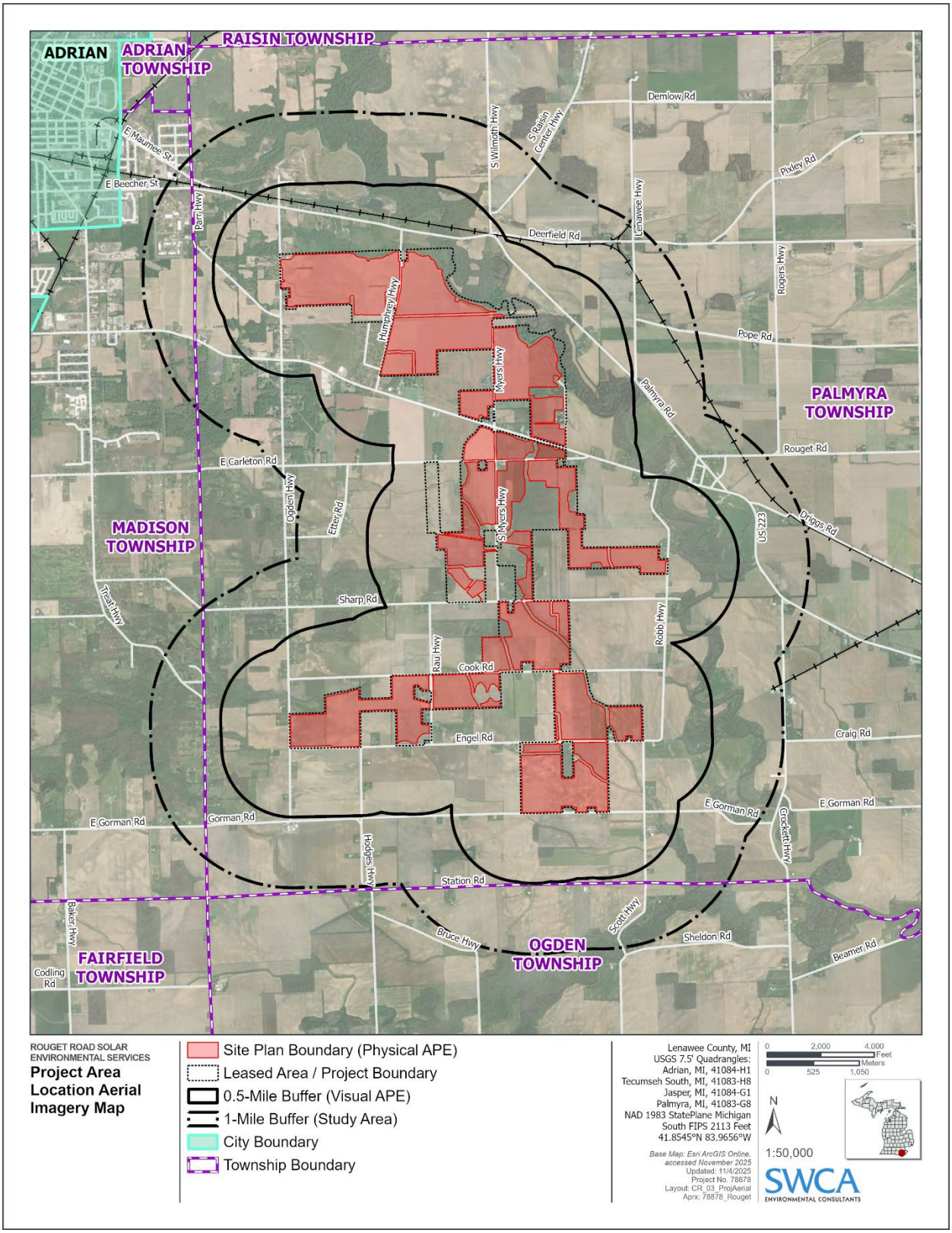

Figure 3. Aerial view showing the site plan boundary and leased area/Project boundary in Palmyra Township, Lenawee County, Michigan.

Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan

JANUARY 2025

PREPARED FOR

Rouget Road, LLC

PREPARED BY

SWCA Environmental Consultants

CULTURAL RESOURCES DESKTOP REVIEW FOR THE ROUGET ROAD, LLC LENAWEE COUNTY, MICHIGAN

Prepared for

Rouget Road, LLC
353 North Clark Street, 30th Floor
Chicago, Illinois 60654
Attn: J Kevin Cole

Prepared by

Rachel Lawrence, M.A., RPA
Heather MacIsaac, B.A.

and

Anna Gilmer, M.A., RPA

SWCA Environmental Consultants
200 22nd Street, Suite 220
Lombard, Illinois 60148
(630) 705-1762
www.swca.com

SWCA Project No. 78878

SWCA Cultural Resources Report No. 25-27

January 2025

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1 INTRODUCTION

SWCA Environmental Consultants (SWCA) completed a cultural resources desktop review for the proposed Rouget Road, LLC (project), located in Lenawee County, Michigan (Figure A-1 in Appendix A). The Project Area spans approximately 2,490 acres (1,008 hectares) of privately owned land near the towns of Adrian, Palmyra, and Ogden. SWCA completed the desktop review for the Project Area plus a surrounding 1.0-mile (1.6-kilometer) buffer around the Project Area. The surrounding 1.0-mile buffer is henceforth referred to as the Study Area (Figures A-2 and A-3).

The objective of the desktop review was to identify existing cultural resources within the Project Area and Study Area to inform project facility siting. Additionally, the Study Area was evaluated to gain an understanding of the type and density of cultural resources in the vicinity of the Project Area. This report summarizes the methods SWCA used to complete the desktop review and presents the results of the background research. It does not serve as Section 106 clearance for the proposed project.

2 REGULATORY FRAMEWORK

Projects in Michigan can come under the purview of two primary cultural resources regulations, the National Historic Preservation Act (NHPA) and Michigan's Natural Resources and Environmental Protection Act. Both are administered by the Michigan State Historic Preservation Office (MI SHPO).

If the project is deemed a federal undertaking (requiring a federal permit, license, or approval; being located on federally owned or managed land; or receiving federal financial assistance), a cultural resources survey most likely would be mandated to ensure compliance with Section 106 of the NHPA. The scope of required cultural resources surveys would then be determined by the functioning federal lead agency in cooperation with the MI SHPO and, if applicable, the pertinent Tribal Historic Preservation Offices as defined in both Section 101 of the National Environmental Policy Act and Section 106 of the NHPA.

Under Michigan law, the state oversees all archaeology performed on state land. The Natural Resources and Environmental Protection Act (Public Act 451 of 1994, Part 761) requires that a permit be obtained prior to undertaking any archaeological investigation on state land.

Public Act 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 megawatts or more, to wind projects with a capacity of 100 megawatts or more, and to energy storage facilities with a capacity of 50 megawatts or more. Public Act 233allows developers the option of applying to the Michigan Public Service Commission (MPSC) to construct utility-scale renewable energy facilities if the local unit of government does not have a compatible renewable energy ordinance. If a compatible renewable energy ordinance is in place, the developer must apply with the local unit of government first, but if the project is denied, the developer may submit to the MPSC for approval. Projects that fall into these categories must identify and provide information on the effects of the project on environmental, natural, and cultural resources.

The project will occur solely on privately held land; thus, no state or local laws requiring archaeological investigations or surveys are anticipated to apply for this project. However, Public Act 233 requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC.

3 METHODOLOGY

SWCA initially submitted a request for in-person research to the MI SHPO on April 7, 2023. Staff at the MI SHPO approved the request and scheduled a research appointment for April 20, 2023. An SWCA archaeologist obtained information in person on previous cultural resources surveys, previously recorded archaeological resources, and previously recorded postcontact architectural resources within the Study Area.

As the Project Area and Study Area were revised in fall 2024, SWCA submitted a second request to the MI SHPO for archaeology and survey site files within the revised Study Area. MI SHPO provided all available records on December 9, 2024. Due to the ongoing updates to the MI SHPO's database, a process that was initiated on February 24, 2024, only archaeology files are currently available. Postcontact architecture files and both postcontact architectural and archaeological survey reports are not currently available as the MI SHPO are scanning these files for upload into a new database. As such, SWCA relied on the April 2023 postcontact architectural resource files and survey reports for this review. SWCA additionally reviewed the National Register of Historic Places (NRHP) database for Michigan as the best available recent data regarding architectural resources.

In addition to the site file search, SWCA investigated historic plat and topographic maps and historic aerial imagery of the Project Area and Study Area. SWCA also researched environmental factors such as modern and historic land use and soil units mapped by the Natural Resources Conservation Service (NRCS) to determine the likelihood of the project to encounter previously unrecorded precontact or postcontact archaeological resources.

4 RESULTS

4.1 Physiography, Geology, and Soils

The Project Area is situated within the Erie-Huron Lake Plain of the Eastern Lake section of the Central Lowland province of the Interior Plains (NRCS 2022:343). The Erie-Huron Lake Plain is a fairly level glacial lake plain with scattered sandy ridges formed by former shorelines and moraines. Elevation ranges from approximately 570 to 815 feet (175 to 250 meters [m]), whereas local relief averages 10 feet (3 m). Major confluences in the Erie-Huron Lake Plain include the Clinton, Huron, and Saginaw Rivers, which empty into the Great Lakes. The Project Area is located within the Floodwood Creek-River Raisin watershed and the Big Meadow Drain-Black Creek watershed, which empty into the River Raisin (U.S. Environmental Protection Agency 2023). Mississippian- to Silurian-age limestone, shale, and dolomite are common along the surface and along the shores of Lake Erie and Lake Huron. Broad, level, and somewhat poorly drained lake plains feature American beech, sugar maple, silver maple, green ash, pin oak, swamp white oak, and American elm, whereas sandy areas feature eastern white pine, eastern hemlock, and other coniferous trees (NRCS 2022:344).

This ecoregion is also part of the Maumee Lake Plain and the Ann Arbor Moraines sub-subsections. The Maumee Lake Plain is a broad, flat, glaciated clay lake plain with rich, loamy soils deeply mantled by till and outwash and dissected by broad glacial drainageways containing sandy soils (Albert 1995). This region formerly included beech-sugar maple forest, elm-ash forest, deciduous swamps, white oak-black oak savannas, wet prairies, and coastal marshes, but now has been largely cultivated (Albert 1995; NRCS 2022). The Ann Arbor Moraines sub-subsection is a long, narrow band of fine- and medium-textured end and ground moraine bordered by flat lake plain on the east and by sandy outwash, end moraine, and ice-contact features to the west. This region formerly supported oak and oak-hickory forests, with oak

savannas along the western edge (Albert 1995). Major wildlife species in the Erie-Huron Lake Plain area include white-tailed deer; cottontail rabbits; squirrels; raccoons; pheasants; bobwhite quail; songbirds; various species of snakes, frogs, and turtles; sunfish; perch; bass; walleye; catfish; carp, sucker; and northern pike.

There are 40 soil series mapped within the Project Area by the NRCS (Table 1). The soils range from very poorly drained to excessively drained loams to sandy loams. The most common soils for the Project Area include Brady and Macomb loams, 0 to 3 percent slopes; Colwood very fine sandy loam, 0 to 3 percent slopes; Wauseon loam, 0 to 3 percent slopes; Ziegenfuss clay loam, 0 to 1 percent slopes; Brady and Macomb sandy loams, 0 to 3 percent slopes; and Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes. These soil types, and their implication for site formation processes and archaeological potential, are discussed further in Section 4.6.

Table 1. Soils within the Project Area

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
BbA	Berrien loamy sand, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BbB	Berrien loamy sand, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcA	Berrien sandy loam, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcB	Berrien sandy loam, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BhA	Brady sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on strand plains	Loamy over sandy and gravelly glaciofluvial deposits
BkA	Brady and Macomb loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BnA	Bronson sandy loam, 0 to 3 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BnB	Bronson sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BoA	Brookston loam, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
CbB	Cadmus sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over loamy till
CeA	Colwood very fine sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CgA	Conover loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Loamy till
GbA	Genesee sandy loam, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
GcA	Genesee and Eel loams, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GgA	Griffin and Sloan loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Clayey till
KbC	Kendallville sandy loam, 7 to 15 percent slopes	Well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over till
KeA	Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on deltas	Stratified loamy glaciofluvial deposits
LcA	Linwood muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Wood organic material over loamy till
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Drainageways on till-floored lake plains	Sandy and/or loamy glaciofluvial deposits over loamy till
NaA	Nappanee silt loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Clayey till
NbB	Nappanee loam, 3 to 7 percent slopes	Somewhat poorly drained	Knolls on ground moraines	Clayey till
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	Somewhat poorly drained	Knolls on ground moraines	Clayey till
OcC	Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded	Excessively drained	Beaches on till-floored lake plains	Glaciofluvial deposits and/or sandy glaciolacustrine deposits over loamy till
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	Poorly drained	Depressions on till plains	Loamy till
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PdB	Plainfield and Berrien loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PeB	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PwmaaA	Pewamo clay loam, dense substratum, 0 to 1 percent slopes	Poorly drained	Drainageways on nearshore zones (relict), flats on nearshore zones (relict)	Clayey till over dense till
RbA	Rollin muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Herbaceous organic material over marl
SbA	Sebewa sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on glacial drainage channels	Loamy over sandy and gravelly glaciofluvial deposits
Sf	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	Poorly drained	Drainageways on stream terraces, drainageways	Loamy drift over sandy and gravelly outwash
WcA	Wauseon loam, 0 to 3 percent slopes	Poorly drained	Depressions on till-floored lake plains	Glaciolacustrine deposits over clayey till

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	Poorly drained	Wave-worked till plains	Clayey till over loamy till
W	Water	N/A	N/A	N/A

Source: NRCS (2024).

4.2 Historical Land Use

SWCA reviewed historic plat and topographic maps, as these sources provide information on past land use within the Project Area and Study Area that may indicate the probability of encountering significant precontact and postcontact cultural resources in or near the Project Area. The historic maps indicate that there has been a general consistency in the road network and land-use patterns from the late nineteenth century into the modern era in the Study Area.

The earliest available map of the Project Area is an 1819 General Land Office survey map (Bureau of Land Management General Land Office 2024). The Project Area is uninhabited. The River Raisin is drawn as a winding water course east of the Project Area. There are patches of marshlands, and tributaries are marked but not fully drawn. No structures are depicted. Palmyra and Lenawee Junction have not yet been established.

The first available plat map, dated 1874, shows that the Project Area and Study Area had been divided into large landholdings. Residences, schools, and churches are depicted. Roads and three railroads also are in place, including the Lenawee County Railroad and Palmyra Road. The current U.S. Highway 233 is shown as a railroad. Several structures are depicted on landholdings within the Project Area. Some of these structures are adjacent to orchards or small agricultural fields. There are branches of unnamed tributaries flowing throughout the Project Area, one of which is the modern Big Meadow Drain (Everts and Stewart 1874).

By 1893, the Project Area is depicted similarly to the 1874 plat. More landowners have appeared, represented by smaller landholdings, and structures are depicted within the Project Area. The unnamed tributaries are still depicted, running through the central and southern portions of the Project Area (Cadwell 1893).

The 1916 plat map shows an increase in landowners once more as the communities of Lenawee Junction and Palmyra continue to grow. Structures also are depicted on these parcels in the Project Area and are shown mostly along roads. U.S. Highway 233 is depicted as the Toledo Western electric railroad. There is another railroad that runs north-south to the Toledo Western electric railroad, connecting from Adrian to Palmyra within the Project Area. This segment of rail had been a road on the 1874 and 1893 plat maps. Several tributaries also are shown within the Project Area (Ogle 1916).

The 1921 plat map does not show individual structures beyond churches and schools, neither of which are in the Project Area. Landowner names are given, and the road network and railroads appear in the same location as on previous plats (*Adrian Daily Telegram* 1921). The 1928 plat presents the same information (*Adrian Daily Telegram* 1928).

SWCA also reviewed historic topographic maps to determine the land use of the Project Area and Study Area. Four historic topographic maps from 1939 to 1972 show that there has been little development from the early twentieth century to the present (U.S. Geological Survey [USGS] 2024). On the earliest available topographic map (Blissfield, Michigan, 1939, 1958 edition), multiple structures are shown in the

Project Area along roadways. The tributaries shown on the plat maps are named and shown: Big Meadow Drain, Bixby Drain, and Grinnell Drain. The road network and railroads are also depicted. The 1941 Blissfield, Michigan, topographic map reveals a similar image. The 1972 Palmyra, Michigan, and 1972 Tecumseh South, Michigan, topographic quadrangles name most of the roads in the Project Area, and they show that residential development had not increased outside of Palmyra and Adrian. Transmission and telecommunication cables are also depicted (USGS 2024).

A review of 17 aerial photographs taken between 1955 and 2022 indicates that minimal land development occurred within the Project Area and its environs. On the aerial images beginning in 1955, the landscape is agricultural. Isolated farmsteads are visible along roadways outside of Palmyra, Lenawee Junction, and Adrian. Drainages are visible either as scars on the landscape or are lined with trees, as is the River Raisin. There are some stands of trees throughout the Project Area. Between 1955 and 2022, no noticeable changes occur to the land use in the Project Area or Study Area (Historic Aerials 2024).

4.3 Previous Cultural Resources Surveys

A review of MI SHPO records identified one cultural resources survey that was conducted in the Project Area and two cultural resources surveys conducted within the Study Area (Table 2). Project ER00-7.17.161134 was a reconnaissance investigation conducted in 2017 by Archaeological Consultants of Ossian. The survey area covered 0.44 acre of land, and no cultural resources were identified during the survey (Stillwell 2017). Project ER17-391 was conducted for the Howard Street/West Michigan CMAQ and Rehabilitation project; however, the MI SHPO records did not contain information on the surveyors, year, or report title. Project B17-258, identified on quad maps in the MI SHPO research repository as Lauterbur 2016, was a Phase I archaeological survey conducted in support of the replacement of the River Raisin Bridge in Palmyra, Michigan. The MI SHPO records did not include information on the extent of the survey; however, no archaeological sites were identified during the survey.

Table 2. Previous Cultural Resources Surveys in the Study Area

Project ID	Project Name	Survey Year	Surveyors	Report Title	Location
ER00-7.17.161134	G2 Cellular Tower Site Review #161134	2017	Archaeological Consultants of Ossian	*An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project #161134) in Palmyra, Lenawee Conty, Michigan. 17FR29Mi.*	Project Area
ER17-391	Howard Street/ West Michigan CMAQ and Rehabilitation	None recorded	None recorded	None recorded	Study Area
B17-258	Lauterbur 2016	2016	Michigan Department of Transportation	*Archaeological Investigations at US-223 River Raisin Bridge Replacement, Palmyra, Lenawee County.*	Study Area

4.4 Previously Recorded Archaeological Sites

[redacted]

[redacted]

4.5 Previously Recorded Architectural Resources and Cemeteries

SWCA reviewed the National Park Service's NRHP database for Lenawee County, Michigan, regarding information on historic districts, buildings, archaeological sites, and other properties eligible for or listed in the NRHP. The NRHP database did not identify any NRHP-listed resources within the Project Area (National Park Service 2024).

SWCA also reviewed historic architecture data provided by the MI SHPO in April 2023. No previously recorded architectural resources are located within the Project Area; three architectural resources are located in the Study Area (Table 4; Appendix A: Figure 5).

No recorded cemeteries are present in the Project Area; two postcontact cemeteries (Palmyra Village Cemetery and Crane Cemetery) are located within the Study Area (Table 5; Appendix A: Figure 5). Palmyra Village Cemetery was included in the MI SHPO site file data, while Crane Cemetery was identified through archival research of historic topographic maps. Due to the data gap in the MI SHPO site file records since February 2024, it is not clear if Crane Cemetery is still absent from MI SHPO site file records.

Table 4. Previously Recorded Historic Architectural Resources in the Study Area

Site ID	Historic Name	City	NRHP Status	Location
P23943	Palmyra Presbyterian Church	Palmyra	Unevaluated	Study Area
P61449	Bruce Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area
P61451	Scott Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area

Table 5. Previously Recorded Cemeteries in the Study Area

Historic Name	Record Source	Location
Palmyra Village Cemetery	MI SHPO site file data	Study Area
Crane Cemetery	Archival research	Study Area

4.6 Geoarchaeology

Geoarchaeology, which is a multidisciplinary field that incorporates topography, geomorphology, geology, and soils, helps archaeologists to understand how geological processes have influenced the preservation of archaeological sites. Research conducted by Monaghan and Lovis (2005) demonstrates that deeply buried soils have an increased probability of sustaining cultural resources where fluvial deposits overlie alluvial deposits as a result of waterways breaching their banks. Monaghan and Lovis developed a predictive geoarchaeological model that takes these effects into account and classifies an area's likelihood of having cultural resources from Low to High-Very High.

Based on the Monaghan and Lovis (2005) model, the Project Area intersects with areas modeled as having moderate to high potential for deeply buried archaeological deposits (Figure A-6). [redacted] Otherwise, the remainder of the Project Area is largely mapped as exhibiting a low potential for deeply buried archaeological deposits.

[redacted]

4.7 Cultural Resources Context and Potential

The potential of the Project Area to contain cultural resources was developed through examination of the natural and topographical characteristics of the Project Area and available historic-era maps and aerial photographs.

4.7.1 Potential for Precontact Archaeological Sites

[redacted]

4.7.2 Potential for Postcontact Archaeological Sites

[redacted]

5 SUMMARY AND RECOMMENDATIONS

In summary, the records review established that one cultural resources survey has been conducted previously within the Project Area, and two cultural resources surveys have been conducted in the Study Area. These compliance surveys were negative and did not result in the recordation of cultural resources within the Project Area or the Study Area. However, [redacted] None of the archaeological sites within the Project Area have been evaluated for listing in the NRHP. There are no previously recorded architectural resources within the Project Area and three architectural resources in the Study Area. Based on MI SHPO records and a review of the NRHP, there are no NRHP-listed resources located within the Project Area or Study Area.

There is an overall moderate probability for significant precontact archaeological sites and a low to moderate probability for significant postcontact archaeological sites within the Project Area. [redacted]

Should the project require archaeological survey, the geoarchaeological modeling (Monaghan and Lovis 2005) suggests that shovel testing and/or deep testing (e.g., auguring) may be necessary [redacted] Pedestrian survey is a viable survey methodology as long as alluvial soils are confined to the plow zone (e.g., 12 inches [30 centimeters]); the limits of shovel testing is typically 3 feet (1 m).

Based on the MPSC regulations and our communications with the MI SHPO (personal communication, Sarah Surface-Evans and Scott Slagor, January 30, 2025), SWCA recommends initiating consultation with the MI SHPO. SWCA understands that MI SHPO has initiated a new consultation process for projects subject to permitting through the MPSC, and that the MI SHPO will provide expert testimony regarding cultural resources to the MPSC. To initiate the consultation process, the MI SHPO requests developers to complete a consultation application, in coordination with a professional archaeologist and architectural historian, The MI SHPO will provide their recommendations for next steps, including survey and avoidance requirements. SWCA understands that RWE will have 1 year after submittal of the MPSC permit application to obtain the approval of survey reports or recommendations submitted to the SHPO.

In keeping with Public Act 233, which requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC, SWCA recommends this document be provided to the MPSC for review. Approval from the MPSC is required before development within the boundaries of these sites occurs.

6 REFERENCES CITED

Adrian Daily Telegram. 1921. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21190/Palmyra+Township/Lenawee+County+1921/Michigan/. Accessed November 14, 2024.

———. 1928. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/1610467/Palmyra+Township++Raisin+River/. Accessed November 14, 2024.

Albert, Dennis A. 1995. Regional landscape ecosystems of Michigan, Minnesota and Wisconsin: A working map and classification. General Technical Report NC-178. U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota. Available at: https://www.nrs.fs.usda.gov/pubs/gtr/other/gtr-nc178/index.html. Accessed November 1, 2024.

Bureau of Land Management General Land Office. 2024. Original Survey Plat, Township 7 North, Range 4 East, 3rd Principal Meridian. Available at: https://glorecords.blm.gov/details/survey/default.aspx?dm_id=27676&sid=usa5y3jo.a4o#surveyDetailsTabIndex=0. Accessed November 14, 2024.

Cadwell, George D. 1893. Atlas of Lenawee County, Michigan. Geo. D. Cadwell and Company, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21077/Palmyra+Township/Lenawee+County+1893/Michigan/. Accessed November 14, 2024.

Everts and Stewart. 1874. Combination Atlas Map of Lenawee County, Michigan. Everts and Stewart, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/20906/Palmyra+Township/. Accessed November 14, 2024.

Historic Aerials. 2024. Historic Aerials Viewer. Available at: https://www.historicaerials.com/viewer. Accessed November 14, 2024.

Monaghan, G. William, and William A. Lovis. 2005. *Modeling Archaeological Site Burial in Southern Michigan: A Geoarchaeological Synthesis*. Michigan State University Press, East Lansing.

National Park Service. 2024. National Register of Historic Places Database and Research. Available at: https://www.nps.gov/subjects/nationalregister/database-research.htm. Accessed January 13, 2025.

Natural Resources Conservation Service (NRCS). 2022. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. Washington, D.C.

———. 2024. Custom Soil Report. Available at: http://websoilsurvey.nrcs.usda.gov. Accessed December 12, 2024.

Ogle, George A. 1916. Standards Atlas of Lenawee County, Michigan. Geo. A. Ogle Publishers and Engravers, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/22243/Palmyra+Township/Lenawee+County+1916/Michigan/. Accessed November 14, 2024.

Stillwell, Larry N. 2017. *An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project No. 161134) in Palmyra, Lenawee County, Michigan*. Archaeological Consultants of Ossian. On file at the Michigan State Historic Preservation Office, Lansing, Michigan.

U.S. Environmental Protection Agency. 2023. How's My Waterway Viewer. Available at: https://mywaterway.epa.gov/. Accessed November 14, 2024.

U.S. Geological Survey (USGS). 2024. National Geologic Map Database Project TopoView. Available at: https://ngmdb.usgs.gov/topoview/viewer/#14/41.8731/-83.9695. Accessed November 14, 2024.

APPENDIX A

Figures

Figure A-1. Location of the proposed Rouget Road, LLC Area in Michigan.

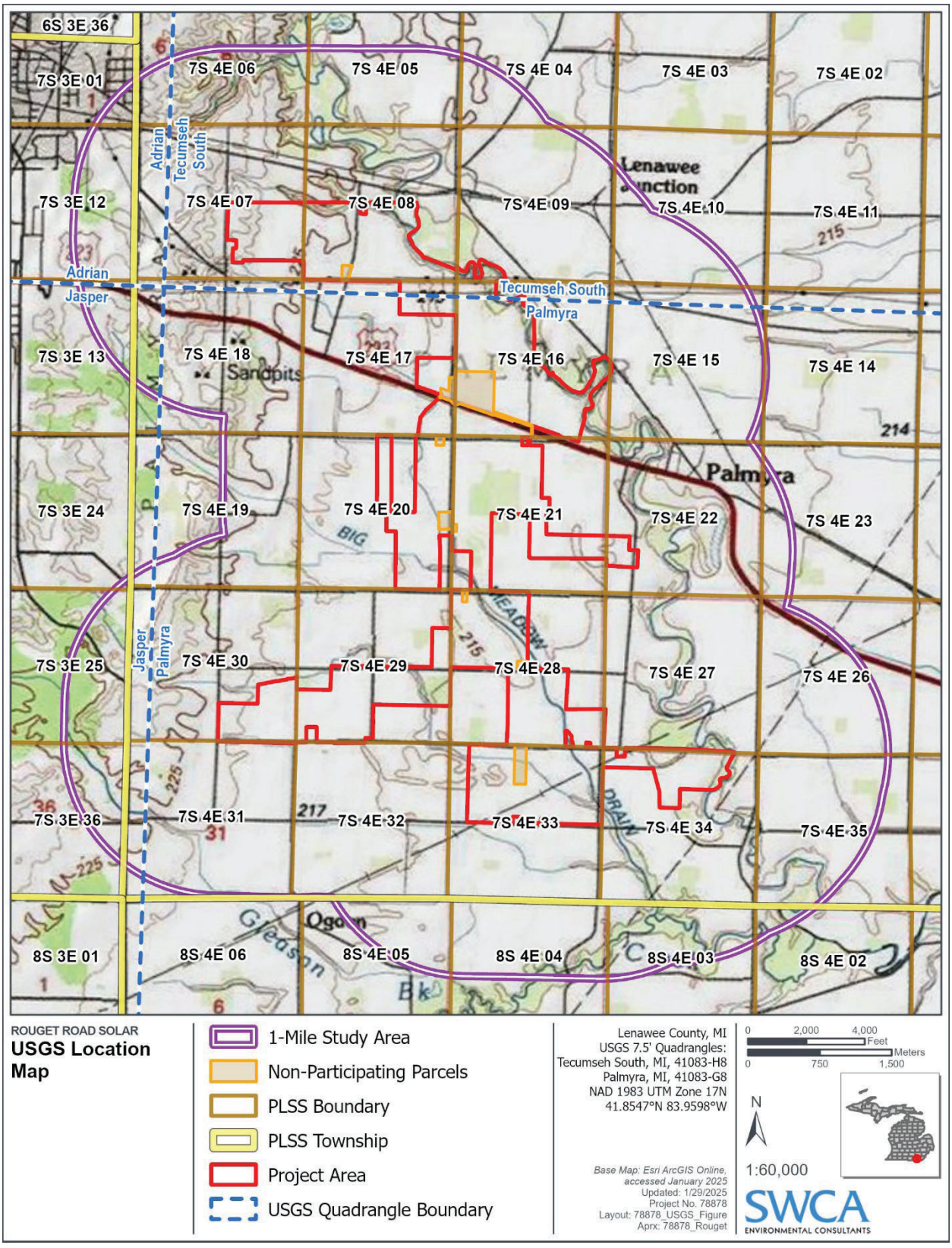

Figure A-2. Location of the Study Area for the proposed Rouget Road, LLC on a USGS topographic map.

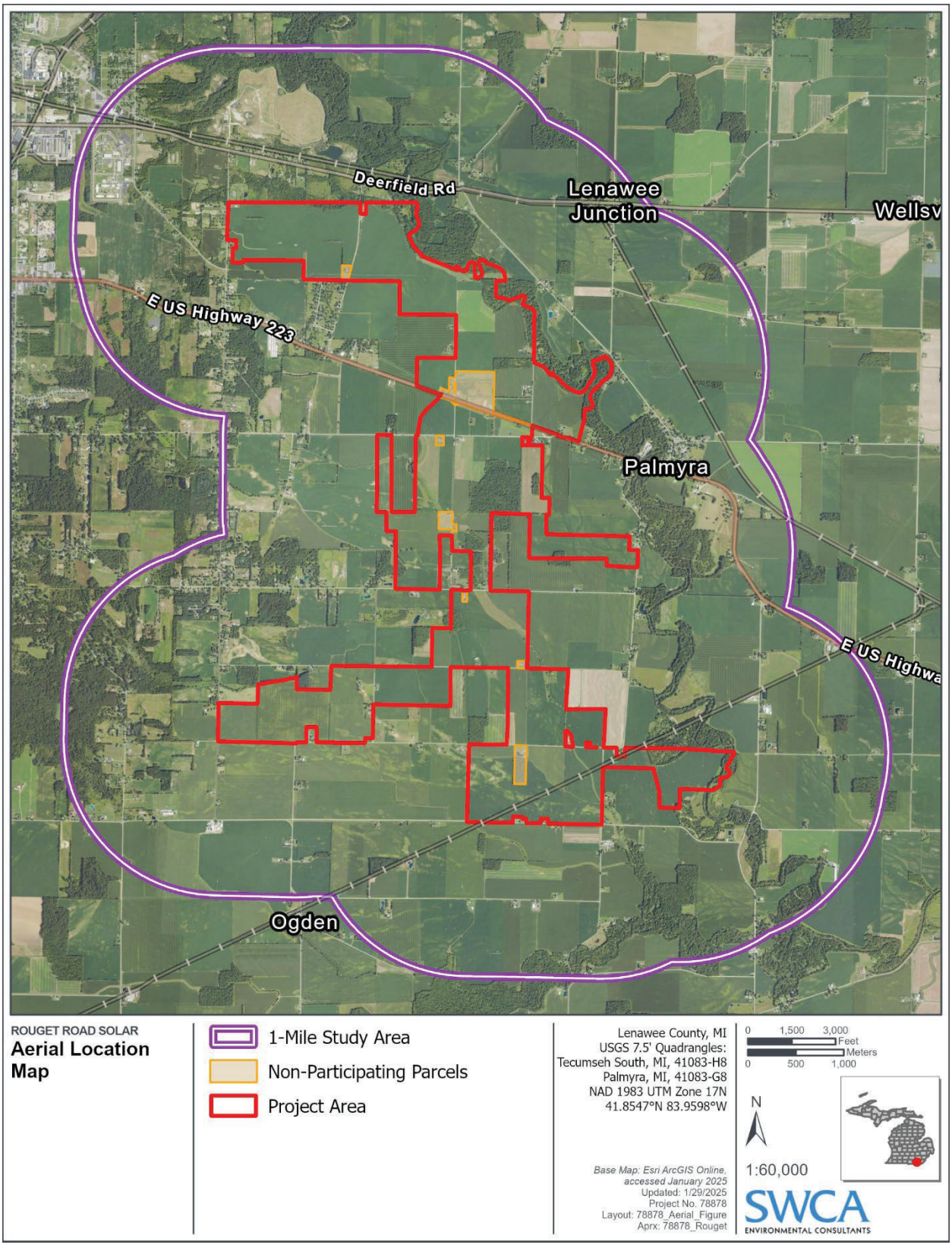

Figure A-3. Overview of the Study Area for the proposed Rouget Road, LLC on aerial imagery.

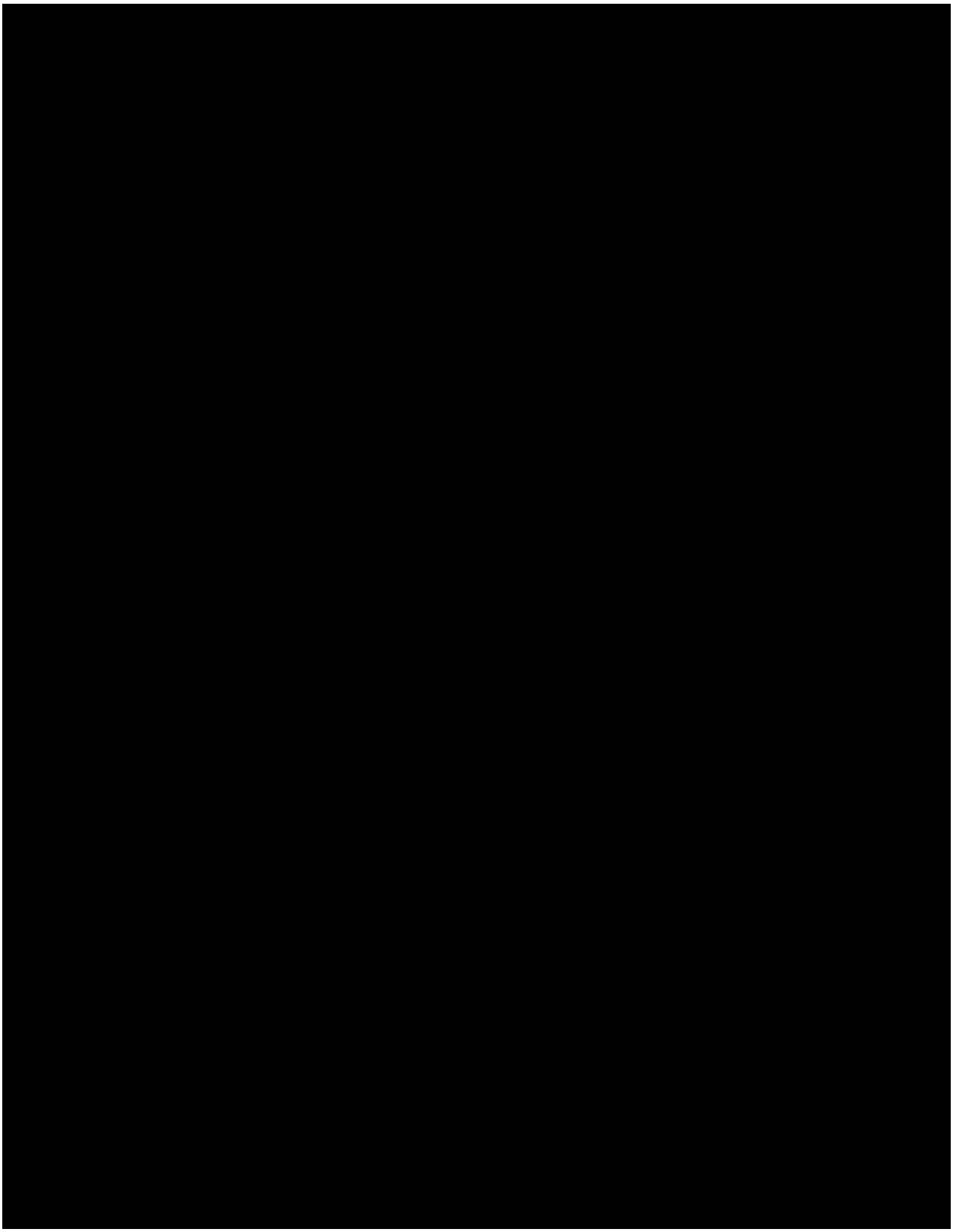

Figure A-4. Results of the background research for previously recorded cultural resources and previously conducted surveys.

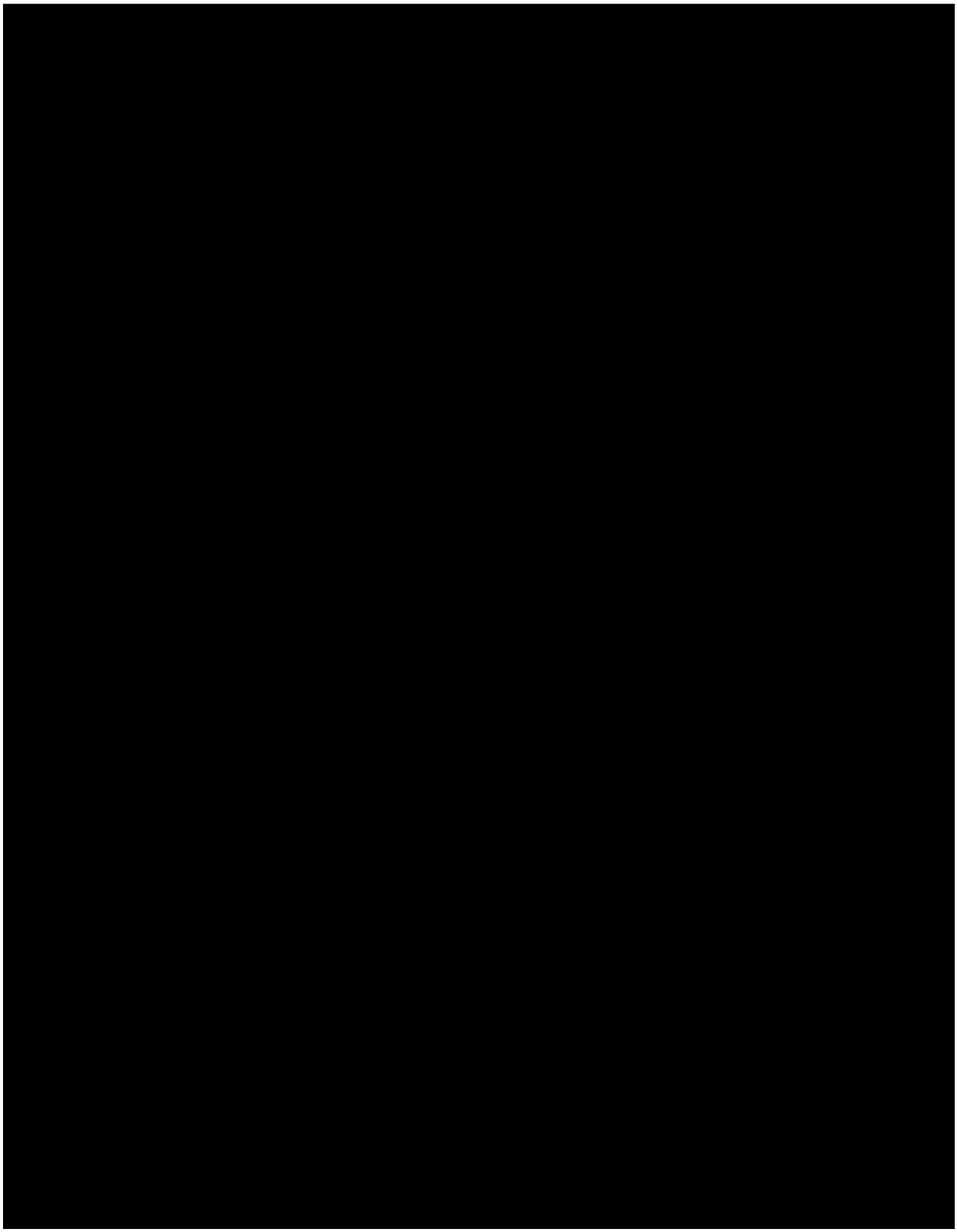

Figure A-5. Results of the background research for postcontact architectural resources and cemeteries.

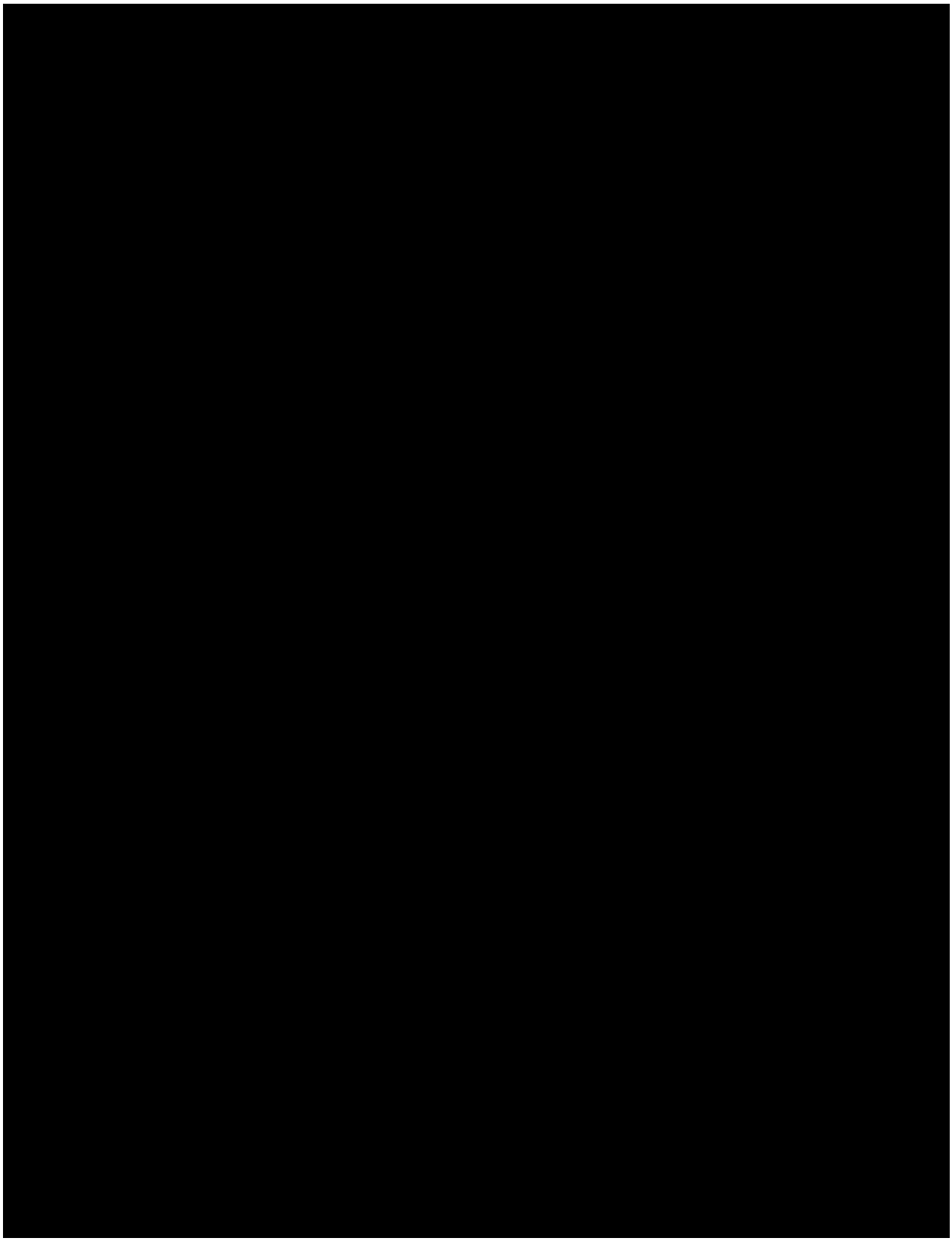

Figure A-6. Areas modeled as having moderate to high potential for deeply buried archaeological deposits in the Project Area and Study Area.

GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
MICHIGAN STRATEGIC FUND
STATE HISTORIC PRESERVATION OFFICE

QUENTIN L. MESSER, JR.
PRESIDENT

September 10, 2025

KEVIN COLE
ROUGET ROAD LLC
10250 PENLAWN DR.
JEROME, MI 49249

RE: SR25-23 PA233 Review Rouget Road, LLC Solar, T07S/R04E/Sec. 7, 8, 9, 15, 16, 17, 20 ,21, 22, 27, 28, 29, 30, 33, and 34, Palmyra Township, Lenawee County (MPSC)

Dear Mr. Cole:

We have received your request for review of the above-cited project under Public Act 233 of 2023 for Renewable Energy and Energy Storage Facility Siting (PA 233) at the above-noted location. We have reviewed the assessment prepared by SWCA, "Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan" and appreciate the information provided. To fully consider and address impacts to cultural and historic sites we require additional information, please send the following:

General

In the materials submitted, the project area boundaries in the submission form and in the Desktop Review do not match. Please ensure that we have the final project boundary maps included in all materials submitted to our office. Desktop Review states that the project plan will avoid archaeological sites, however, the project mapping provided does not make this apparent or clear. We cannot assess the impact of the proposed project on historic resources without accurate mapping information. Additionally, we would like to see the locations of staging areas, vehicle traffic, and any other areas that may have ground disturbance mapped.

Archaeological Resources

Due to the presence of previously documented sites within and near the project area, and the high archaeological sensitivity for the River Raisin valley generally, SHPO requests full archaeological survey for the entire project area, including staging areas. In particular, the boundaries of site 20LE28 are poorly delineated. In order to avoid this site, which is known to contain burials, additional survey methodologies may be necessary beyond pedestrian survey or shovel testing***. SHPO recommends consulting with our office and Tribal Nations with historic connections to this region to develop an appropriate methodology***, which may include geophysical prospection or historic human remains detection dog (HRD) survey. SHPO also recommends developing an Unanticipated Discovery Plan (UDP) for the project. A UDP specifies who will be contacted and what measures will be taken in the event of an unanticipated discovery of archaeological materials or human remains during the project implementation. Please see the UDP template attached, for an example of how these documents are organized. SHPO encourages the project proponent to work with consulting party tribes to develop an

appropriate UDP and protocol for handling human remains.

Above-ground Resources

SHPO concurs with the proposed methodology of utilizing the Above Ground Table in lieu of identification forms except that we require identification forms for properties that are identified as eligible. The table does not provide enough information for eligible properties. For eligible properties, photographs of all resources must also be included in an attachment with Architectural Properties Identification Form. When discussing effects to above-ground resources, please be sure to provide discussion of visual impacts as well as visual barriers in place that may play in to effects determinations. Also be sure that the Historic Resource Survey Report contains enough history and contextual information about the area and resources for SHPO to adequately assess eligibility.

Additional information must be submitted online through our Additional Information Portal.

Please note that our review cannot proceed until we are able to consider the information requested above. This letter is not concurrence. If you have any questions, please contact please contact Senior Archaeologist, Sarah Surface-Evans, surfaceevanss1@michigan.gov, (517) 282-7959 or Historian, Katlyn Burns Yancho, at 517-256-3416, burnsyanchok@michigan.gov. **Please reference our project number in all communication with this office regarding this review.** Thank you for your consultation.

Sincerely,

Sarah Surface-Evans, PhD, RPA
Senior Archaeologist

SES:KAK:KBY:SSE

Enclosure(s): UDP Template

Copy: Anna Gilmer, SWCA

Hannahville Indian Community, Michigan

From:	Jonathan Libbon
To:	"dustin.meshigaud@hannahville.org"
Cc:	Carol Mcknight; Aleyda Galan; Cole, J Kevin; Quarles, Mark; Anna Gilmer
Subject:	Rouget Road Solar Consultation Letter
Date:	Thursday, November 20, 2025 5:01:00 PM
Attachments:	Rouget Tribal Consulation LTR_20Nov2025.pdf image001.png
Sensitivity:	Private

Good Afternoon Dustin,

On behalf of Rouget Road Solar Farm LLC, a wholly-owned subsidiary of RWE Clean Energy LLC (RWE), we are reaching out to request your input on the Rouget Road Solar Farm Project, a proposed solar facility in Lenawee County, Michigan. The facility will require a state siting certificate from the Michigan Public Service Commission (MPSC). The attached letter and documentation outline the project and provide details on the cultural resource work completed to date. We are seeking comments from your area of expertise regarding any potential environmental or cultural effects associated with this project.

Please let me or Kevin Cole (cc'd), the project manager from RWE, know if you have any questions about the project.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

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11/20/2025

Dear Tribal Historic Preservation Officer and/or Tribal Cultural Representative,

As part of its responsibilities under Michigan Public Act 233 of 2023 (PA 233), *Renewable Energy and Energy Storage Facility Siting*, the Michigan Public Service Commission (MPSC) is seeking consultation (as required in PA 233 Section 224.1b[1]) and determining the area of potential effects ("APE") for the proposed project. Federally listed sovereign Nations with an interest in the state of Michigan are invited to review and comment on Rouget Road Solar Farm, LLC's (Rouget Road Solar Farm) (a wholly-owned subsidiary of RWE Clean Energy LLC [RWE]) proposed **Rouget Road Solar Farm Project** (the "Project"). The proposed Project will require a state-siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC (PA 233 Section 226.7b). Although Rouget Road Solar Farm requests a review and comment on the Project, the MPSC is the state agency and may be communicated with directly.

Based on Michigan State Historic Preservation Office (MI SHPO) guidance from their *Instructions for the Application for PA 233 Renewable Energy Storage Facility Siting Consultation Form*:

> "**Public Act 233** requires the applicant for energy siting and storage facilities to consider and address impacts *to the environment and natural resources, including, but not limited to, sensitive habitats and waterways, wetlands and floodplains, wildlife corridors, parks,* ***historic and cultural sites****, and threatened or endangered species*. The applicant must submit this information to the Michigan Public Service Commission (MPSC) for consideration in permitting the project. In order to facilitate considerations of historic and cultural sites (hereafter Historic Properties), the MPSC has required applicants to consult with the State Historic Preservation Office (SHPO)."

This letter is part of the early coordination phase of the environmental review process, requesting comments associated with this Project. We are requesting comments from your area of expertise regarding any possible environmental or cultural effects associated with this Project. Please provide any additional information you may have regarding potential cultural resources in the Project area so they may be accounted for during the environmental review of this Project. This information can be provided directly to RWE or the MPSC.

Project Description

The proposed Project is southeast of the city of Adrian, in Palmyra Township, Lenawee County, Michigan (Figure 1). Historic Mapping places the proposed Project area in Sections 7, 8, 9, 15, 16, 17, 20, 21, 22, 27, 28, 29, 30, 33, and 34 of Township 7 South, Range 4 East as seen on the enclosed USGS 7.5 series for Tecumseh South and Palmyra, Michigan Topographic Quadrangle map (Figure 2). Rouget Road Solar Farm is proposing to construct a 175-megawatt (MW) alternating current (AC) solar photovoltaic power generating facility. The leased area/Project area boundary includes approximately 2,142 acres (867 hectares) (Figures 2 and 3). Construction will require 1,513 acres (612 ha) of what is currently primarily agricultural land (see site plan boundary in Figure 1). Limited tree removal is planned across 7.96 acres (3.22 ha). Proposed work required for the Project includes construction of a switchyard, substations, access

[1] Sections refer to those found at: https://www.legislature.mi.gov/documents/2023-2024/publicact/htm/2023-PA-0233.htm

roads, fencing, MV electrical cabling, and solar panel structures. Construction may also include an operations and maintenance building.

Project Permitting
The proposed Project will require a siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC.

PA 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 MW or more, to wind projects with a capacity of 100 MW or more, and energy storage facilities with a capacity of 50 MW or more. Projects that fall into these categories must identify and provide information on the effects of the Project on environmental, natural, and cultural resources. Additional PA 233 information is available online at State Project Reviews | MiPlace[2], and a Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the MPSC is available online at Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the Michigan Public Service Commission. [3]

Cultural Resource Investigations
The APE is the area in which the proposed Project may cause alterations in the character or use of historic resources. As the site plan boundary includes all locations that may be impacted by ground disturbing activities related to the project undertaking, it is considered the physical APE (see Figure 1). The visual APE for assessing visual effects to historic-age resources is a 0.5-mile buffer from the boundaries of the Project area (e.g., leased area/project boundary) (see Figure 2). This boundary will be modified based on visual intrusions that may obscure the project.

Rouget Road Solar Farm has contracted SWCA Environmental Consultants (SWCA) to conduct the archaeological and architectural history surveys. Due to the presence of previously--documented archaeology sites in and near the Project area, and the archaeological sensitivity for the River Raisin Valley, SWCA will conduct a full archaeological survey for the physical APE, including staging areas. The boundaries of [redacted], is mapped as lying within the proposed Project area; however, these site boundaries are mapped based off archival records and the extent of the complex is poorly understood. In order to be sensitive toward this [redacted], we are asking for your input on the extent of the complex and the survey methodologies that may be necessary beyond [redacted] An Unanticipated Discoveries Plan (Exhibit A-1.14 in the MPSC permit application) has been prepared.

Summary of Requested Action
We look forward to consulting with your office on this Project and to a continued dialogue. We ask that you provide any comments regarding the Project area following your review of the enclosure. Please use the above Project name and Project description in your reply.

In summary, the MPSC and Rouget Road Solar Farm are requesting Tribal Governments to:

[2] https://www.miplace.org/historic-preservation/programs-and-services/cultural-resource-management-and-planning/state-project-reviews/

[3] https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/consumer/MPSC_Tribal_Involvement_Guide.pdf?rev=399582a67fbe46e883e6f21d1325e785&hash=AA471378E81539AFBBA758AB04FB3D25

1. Review the Project information.
2. Identify cultural or environmental concerns.
3. Provide feedback on archaeological methodologies (especially near site 20LE28).
4. Ensure that any cultural resources are addressed in the MPSC permitting process.

All comments will be documented and considered in Project design and the forthcoming MPSC state siting process. Consultation with SHPO and the THPOs included in the distribution list below will be incorporated into the cultural survey plan, recordation, and design updates as needed. Your timely response will greatly help us incorporate your concerns into the development of the Project. For that purpose, we request that you provide comments by December 20, 2025.

Tribal consulting parties may respond to myself (Kevin Cole) at rougetroadsola@rwe.com with any comments or concerns. Alternatively, you can reach out directly to Gustavo Cordero at the MPSC at corderog@michigan.gov.

Respectfully,

Kevin Cole
RWE Development Manager
rougetroadsola@rwe.com

cc: Gustavo Cordero, Michigan Public Service Commission
Carol McKnight, SWCA Environmental Consultants
Anna Gilmer, SWCA Environmental Consultants

Distribution List:
Forest County Potawatomi Community, Wisconsin
Hannahville Indian Community, Michigan
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
Little Traverse Bay Bands of Odawa Indians, Michigan
Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan
Menominee Indian Tribe of Wisconsin
Miami Tribe of Oklahoma
Pokagon Band of Potawatomi Indians, Michigan and Indiana
Sault Ste. Marie Tribe of Chippewa Indians, Michigan
Seneca-Cayuga Nation

Enclosures:
1. Figures
    a. Figure 1: State location map
    b. Figure 2: Portions of the USGS 7.5' series Tecumseh South and Palmyra Michigan Topographic Quadrangles showing the Project area.
    c. Figure 3: Aerial view of the Project area location in Palmyra Township, Lenawee County, Michigan.
2. Cultural Desktop Report
3. SHPO PA233 Response

Figure 1. Location of the proposed Rouget Road Solar Project Area in Michigan.

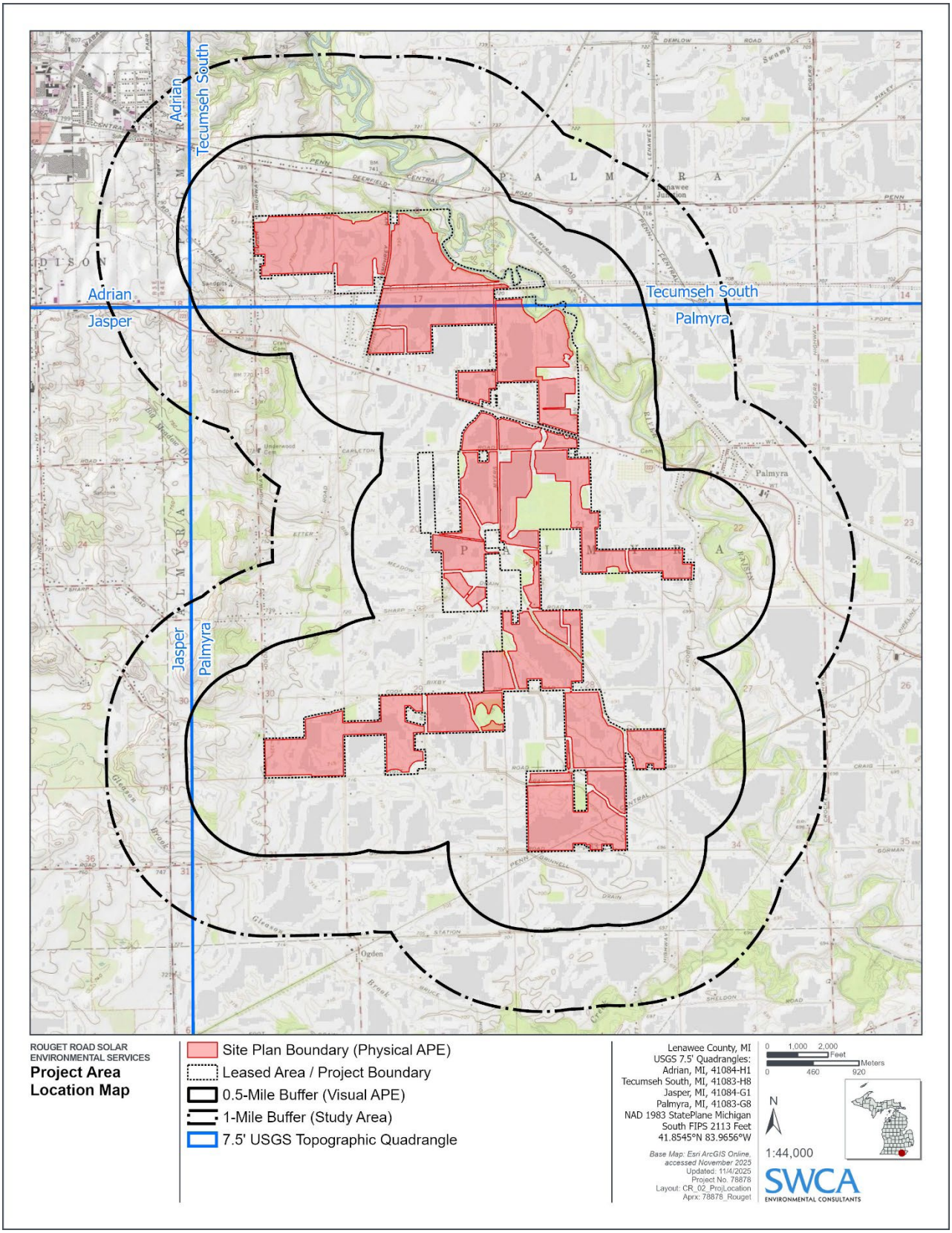

Figure 2. Portions of the USGS 7.5' series Tecumseh South and Palmyra, Michigan Topographic Quadrangles showing the site plan boundary and leased area/Project boundary.

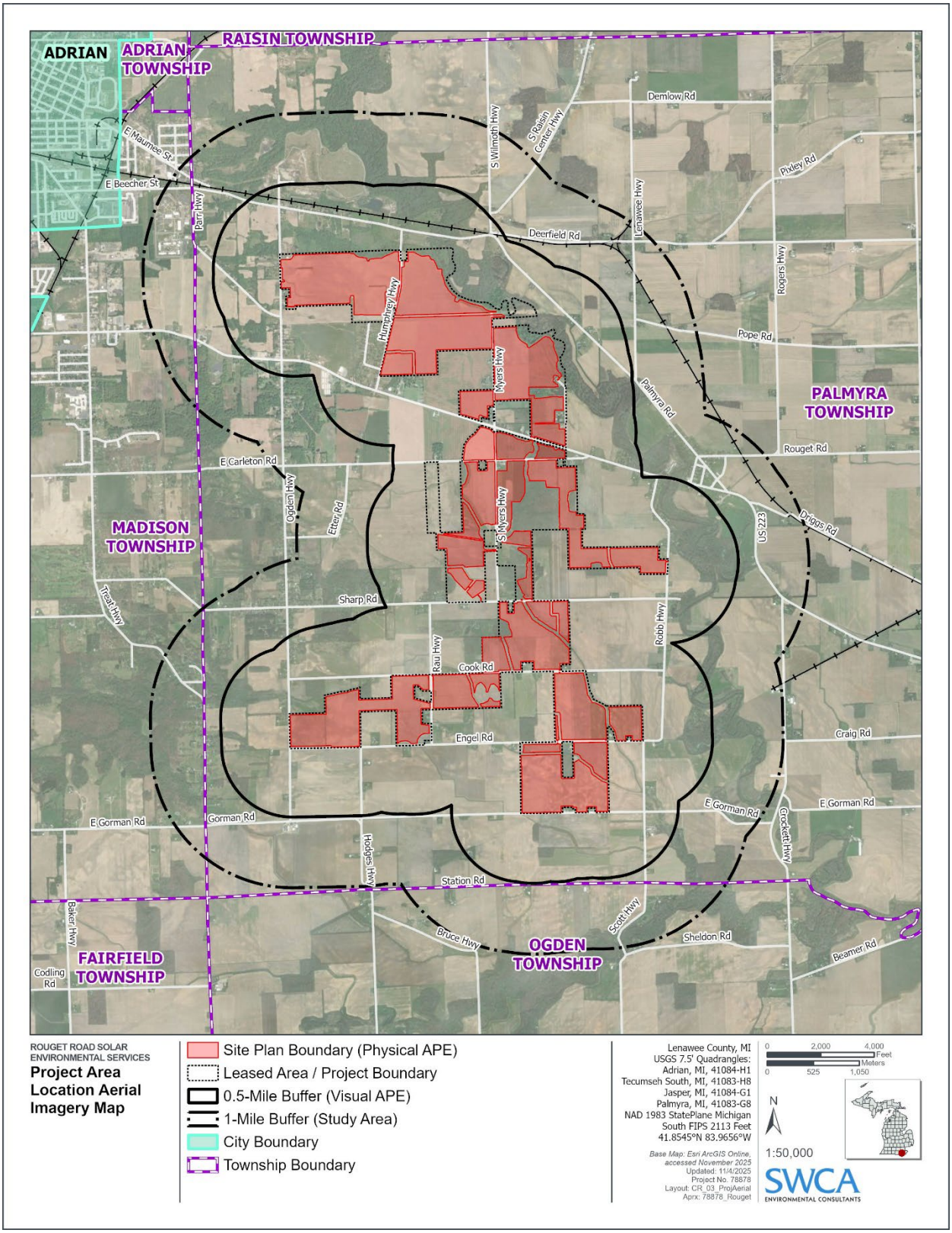

Figure 3. Aerial view showing the site plan boundary and leased area/Project boundary in Palmyra Township, Lenawee County, Michigan.

Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan

JANUARY 2025

PREPARED FOR

Rouget Road, LLC

PREPARED BY

SWCA Environmental Consultants

CULTURAL RESOURCES DESKTOP REVIEW FOR THE ROUGET ROAD, LLC LENAWEE COUNTY, MICHIGAN

Prepared for

Rouget Road, LLC
353 North Clark Street, 30th Floor
Chicago, Illinois 60654
Attn: J Kevin Cole

Prepared by

Rachel Lawrence, M.A., RPA
Heather MacIsaac, B.A.

and

Anna Gilmer, M.A., RPA

SWCA Environmental Consultants
200 22nd Street, Suite 220
Lombard, Illinois 60148
(630) 705-1762
www.swca.com

SWCA Project No. 78878

SWCA Cultural Resources Report No. 25-27

January 2025

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1 INTRODUCTION

SWCA Environmental Consultants (SWCA) completed a cultural resources desktop review for the proposed Rouget Road, LLC (project), located in Lenawee County, Michigan (Figure A-1 in Appendix A). The Project Area spans approximately 2,490 acres (1,008 hectares) of privately owned land near the towns of Adrian, Palmyra, and Ogden. SWCA completed the desktop review for the Project Area plus a surrounding 1.0-mile (1.6-kilometer) buffer around the Project Area. The surrounding 1.0-mile buffer is henceforth referred to as the Study Area (Figures A-2 and A-3).

The objective of the desktop review was to identify existing cultural resources within the Project Area and Study Area to inform project facility siting. Additionally, the Study Area was evaluated to gain an understanding of the type and density of cultural resources in the vicinity of the Project Area. This report summarizes the methods SWCA used to complete the desktop review and presents the results of the background research. It does not serve as Section 106 clearance for the proposed project.

2 REGULATORY FRAMEWORK

Projects in Michigan can come under the purview of two primary cultural resources regulations, the National Historic Preservation Act (NHPA) and Michigan's Natural Resources and Environmental Protection Act. Both are administered by the Michigan State Historic Preservation Office (MI SHPO).

If the project is deemed a federal undertaking (requiring a federal permit, license, or approval; being located on federally owned or managed land; or receiving federal financial assistance), a cultural resources survey most likely would be mandated to ensure compliance with Section 106 of the NHPA. The scope of required cultural resources surveys would then be determined by the functioning federal lead agency in cooperation with the MI SHPO and, if applicable, the pertinent Tribal Historic Preservation Offices as defined in both Section 101 of the National Environmental Policy Act and Section 106 of the NHPA.

Under Michigan law, the state oversees all archaeology performed on state land. The Natural Resources and Environmental Protection Act (Public Act 451 of 1994, Part 761) requires that a permit be obtained prior to undertaking any archaeological investigation on state land.

Public Act 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 megawatts or more, to wind projects with a capacity of 100 megawatts or more, and to energy storage facilities with a capacity of 50 megawatts or more. Public Act 233allows developers the option of applying to the Michigan Public Service Commission (MPSC) to construct utility-scale renewable energy facilities if the local unit of government does not have a compatible renewable energy ordinance. If a compatible renewable energy ordinance is in place, the developer must apply with the local unit of government first, but if the project is denied, the developer may submit to the MPSC for approval. Projects that fall into these categories must identify and provide information on the effects of the project on environmental, natural, and cultural resources.

The project will occur solely on privately held land; thus, no state or local laws requiring archaeological investigations or surveys are anticipated to apply for this project. However, Public Act 233 requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC.

3 METHODOLOGY

SWCA initially submitted a request for in-person research to the MI SHPO on April 7, 2023. Staff at the MI SHPO approved the request and scheduled a research appointment for April 20, 2023. An SWCA archaeologist obtained information in person on previous cultural resources surveys, previously recorded archaeological resources, and previously recorded postcontact architectural resources within the Study Area.

As the Project Area and Study Area were revised in fall 2024, SWCA submitted a second request to the MI SHPO for archaeology and survey site files within the revised Study Area. MI SHPO provided all available records on December 9, 2024. Due to the ongoing updates to the MI SHPO's database, a process that was initiated on February 24, 2024, only archaeology files are currently available. Postcontact architecture files and both postcontact architectural and archaeological survey reports are not currently available as the MI SHPO are scanning these files for upload into a new database. As such, SWCA relied on the April 2023 postcontact architectural resource files and survey reports for this review. SWCA additionally reviewed the National Register of Historic Places (NRHP) database for Michigan as the best available recent data regarding architectural resources.

In addition to the site file search, SWCA investigated historic plat and topographic maps and historic aerial imagery of the Project Area and Study Area. SWCA also researched environmental factors such as modern and historic land use and soil units mapped by the Natural Resources Conservation Service (NRCS) to determine the likelihood of the project to encounter previously unrecorded precontact or postcontact archaeological resources.

4 RESULTS

4.1 Physiography, Geology, and Soils

The Project Area is situated within the Erie-Huron Lake Plain of the Eastern Lake section of the Central Lowland province of the Interior Plains (NRCS 2022:343). The Erie-Huron Lake Plain is a fairly level glacial lake plain with scattered sandy ridges formed by former shorelines and moraines. Elevation ranges from approximately 570 to 815 feet (175 to 250 meters [m]), whereas local relief averages 10 feet (3 m). Major confluences in the Erie-Huron Lake Plain include the Clinton, Huron, and Saginaw Rivers, which empty into the Great Lakes. The Project Area is located within the Floodwood Creek-River Raisin watershed and the Big Meadow Drain-Black Creek watershed, which empty into the River Raisin (U.S. Environmental Protection Agency 2023). Mississippian- to Silurian-age limestone, shale, and dolomite are common along the surface and along the shores of Lake Erie and Lake Huron. Broad, level, and somewhat poorly drained lake plains feature American beech, sugar maple, silver maple, green ash, pin oak, swamp white oak, and American elm, whereas sandy areas feature eastern white pine, eastern hemlock, and other coniferous trees (NRCS 2022:344).

This ecoregion is also part of the Maumee Lake Plain and the Ann Arbor Moraines sub-subsections. The Maumee Lake Plain is a broad, flat, glaciated clay lake plain with rich, loamy soils deeply mantled by till and outwash and dissected by broad glacial drainageways containing sandy soils (Albert 1995). This region formerly included beech-sugar maple forest, elm-ash forest, deciduous swamps, white oak-black oak savannas, wet prairies, and coastal marshes, but now has been largely cultivated (Albert 1995; NRCS 2022). The Ann Arbor Moraines sub-subsection is a long, narrow band of fine- and medium-textured end and ground moraine bordered by flat lake plain on the east and by sandy outwash, end moraine, and ice-contact features to the west. This region formerly supported oak and oak-hickory forests, with oak

savannas along the western edge (Albert 1995). Major wildlife species in the Erie-Huron Lake Plain area include white-tailed deer; cottontail rabbits; squirrels; raccoons; pheasants; bobwhite quail; songbirds; various species of snakes, frogs, and turtles; sunfish; perch; bass; walleye; catfish; carp, sucker; and northern pike.

There are 40 soil series mapped within the Project Area by the NRCS (Table 1). The soils range from very poorly drained to excessively drained loams to sandy loams. The most common soils for the Project Area include Brady and Macomb loams, 0 to 3 percent slopes; Colwood very fine sandy loam, 0 to 3 percent slopes; Wauseon loam, 0 to 3 percent slopes; Ziegenfuss clay loam, 0 to 1 percent slopes; Brady and Macomb sandy loams, 0 to 3 percent slopes; and Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes. These soil types, and their implication for site formation processes and archaeological potential, are discussed further in Section 4.6.

Table 1. Soils within the Project Area

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
BbA	Berrien loamy sand, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BbB	Berrien loamy sand, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcA	Berrien sandy loam, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcB	Berrien sandy loam, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BhA	Brady sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on strand plains	Loamy over sandy and gravelly glaciofluvial deposits
BkA	Brady and Macomb loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BnA	Bronson sandy loam, 0 to 3 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BnB	Bronson sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BoA	Brookston loam, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
CbB	Cadmus sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over loamy till
CeA	Colwood very fine sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CgA	Conover loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Loamy till
GbA	Genesee sandy loam, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
GcA	Genesee and Eel loams, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GgA	Griffin and Sloan loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Clayey till
KbC	Kendallville sandy loam, 7 to 15 percent slopes	Well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over till
KeA	Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on deltas	Stratified loamy glaciofluvial deposits
LcA	Linwood muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Wood organic material over loamy till
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Drainageways on till-floored lake plains	Sandy and/or loamy glaciofluvial deposits over loamy till
NaA	Nappanee silt loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Clayey till
NbB	Nappanee loam, 3 to 7 percent slopes	Somewhat poorly drained	Knolls on ground moraines	Clayey till
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	Somewhat poorly drained	Knolls on ground moraines	Clayey till
OcC	Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded	Excessively drained	Beaches on till-floored lake plains	Glaciofluvial deposits and/or sandy glaciolacustrine deposits over loamy till
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	Poorly drained	Depressions on till plains	Loamy till
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PdB	Plainfield and Berrien loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PeB	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PwmaaA	Pewamo clay loam, dense substratum, 0 to 1 percent slopes	Poorly drained	Drainageways on nearshore zones (relict), flats on nearshore zones (relict)	Clayey till over dense till
RbA	Rollin muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Herbaceous organic material over marl
SbA	Sebewa sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on glacial drainage channels	Loamy over sandy and gravelly glaciofluvial deposits
Sf	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	Poorly drained	Drainageways on stream terraces, drainageways	Loamy drift over sandy and gravelly outwash
WcA	Wauseon loam, 0 to 3 percent slopes	Poorly drained	Depressions on till-floored lake plains	Glaciolacustrine deposits over clayey till

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	Poorly drained	Wave-worked till plains	Clayey till over loamy till
W	Water	N/A	N/A	N/A

Source: NRCS (2024).

4.2 Historical Land Use

SWCA reviewed historic plat and topographic maps, as these sources provide information on past land use within the Project Area and Study Area that may indicate the probability of encountering significant precontact and postcontact cultural resources in or near the Project Area. The historic maps indicate that there has been a general consistency in the road network and land-use patterns from the late nineteenth century into the modern era in the Study Area.

The earliest available map of the Project Area is an 1819 General Land Office survey map (Bureau of Land Management General Land Office 2024). The Project Area is uninhabited. The River Raisin is drawn as a winding water course east of the Project Area. There are patches of marshlands, and tributaries are marked but not fully drawn. No structures are depicted. Palmyra and Lenawee Junction have not yet been established.

The first available plat map, dated 1874, shows that the Project Area and Study Area had been divided into large landholdings. Residences, schools, and churches are depicted. Roads and three railroads also are in place, including the Lenawee County Railroad and Palmyra Road. The current U.S. Highway 233 is shown as a railroad. Several structures are depicted on landholdings within the Project Area. Some of these structures are adjacent to orchards or small agricultural fields. There are branches of unnamed tributaries flowing throughout the Project Area, one of which is the modern Big Meadow Drain (Everts and Stewart 1874).

By 1893, the Project Area is depicted similarly to the 1874 plat. More landowners have appeared, represented by smaller landholdings, and structures are depicted within the Project Area. The unnamed tributaries are still depicted, running through the central and southern portions of the Project Area (Cadwell 1893).

The 1916 plat map shows an increase in landowners once more as the communities of Lenawee Junction and Palmyra continue to grow. Structures also are depicted on these parcels in the Project Area and are shown mostly along roads. U.S. Highway 233 is depicted as the Toledo Western electric railroad. There is another railroad that runs north-south to the Toledo Western electric railroad, connecting from Adrian to Palmyra within the Project Area. This segment of rail had been a road on the 1874 and 1893 plat maps. Several tributaries also are shown within the Project Area (Ogle 1916).

The 1921 plat map does not show individual structures beyond churches and schools, neither of which are in the Project Area. Landowner names are given, and the road network and railroads appear in the same location as on previous plats (*Adrian Daily Telegram* 1921). The 1928 plat presents the same information (*Adrian Daily Telegram* 1928).

SWCA also reviewed historic topographic maps to determine the land use of the Project Area and Study Area. Four historic topographic maps from 1939 to 1972 show that there has been little development from the early twentieth century to the present (U.S. Geological Survey [USGS] 2024). On the earliest available topographic map (Blissfield, Michigan, 1939, 1958 edition), multiple structures are shown in the

Project Area along roadways. The tributaries shown on the plat maps are named and shown: Big Meadow Drain, Bixby Drain, and Grinnell Drain. The road network and railroads are also depicted. The 1941 Blissfield, Michigan, topographic map reveals a similar image. The 1972 Palmyra, Michigan, and 1972 Tecumseh South, Michigan, topographic quadrangles name most of the roads in the Project Area, and they show that residential development had not increased outside of Palmyra and Adrian. Transmission and telecommunication cables are also depicted (USGS 2024).

A review of 17 aerial photographs taken between 1955 and 2022 indicates that minimal land development occurred within the Project Area and its environs. On the aerial images beginning in 1955, the landscape is agricultural. Isolated farmsteads are visible along roadways outside of Palmyra, Lenawee Junction, and Adrian. Drainages are visible either as scars on the landscape or are lined with trees, as is the River Raisin. There are some stands of trees throughout the Project Area. Between 1955 and 2022, no noticeable changes occur to the land use in the Project Area or Study Area (Historic Aerials 2024).

4.3 Previous Cultural Resources Surveys

A review of MI SHPO records identified one cultural resources survey that was conducted in the Project Area and two cultural resources surveys conducted within the Study Area (Table 2). Project ER00-7.17.161134 was a reconnaissance investigation conducted in 2017 by Archaeological Consultants of Ossian. The survey area covered 0.44 acre of land, and no cultural resources were identified during the survey (Stillwell 2017). Project ER17-391 was conducted for the Howard Street/West Michigan CMAQ and Rehabilitation project; however, the MI SHPO records did not contain information on the surveyors, year, or report title. Project B17-258, identified on quad maps in the MI SHPO research repository as Lauterbur 2016, was a Phase I archaeological survey conducted in support of the replacement of the River Raisin Bridge in Palmyra, Michigan. The MI SHPO records did not include information on the extent of the survey; however, no archaeological sites were identified during the survey.

Table 2. Previous Cultural Resources Surveys in the Study Area

Project ID	Project Name	Survey Year	Surveyors	Report Title	Location
ER00-7.17.161134	G2 Cellular Tower Site Review #161134	2017	Archaeological Consultants of Ossian	*An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project #161134) in Palmyra, Lenawee Conty, Michigan. 17FR29Mi.*	Project Area
ER17-391	Howard Street/ West Michigan CMAQ and Rehabilitation	None recorded	None recorded	None recorded	Study Area
B17-258	Lauterbur 2016	2016	Michigan Department of Transportation	*Archaeological Investigations at US-223 River Raisin Bridge Replacement, Palmyra, Lenawee County.*	Study Area

4.4 Previously Recorded Archaeological Sites

[redacted]

[redacted]

4.5 Previously Recorded Architectural Resources and Cemeteries

SWCA reviewed the National Park Service's NRHP database for Lenawee County, Michigan, regarding information on historic districts, buildings, archaeological sites, and other properties eligible for or listed in the NRHP. The NRHP database did not identify any NRHP-listed resources within the Project Area (National Park Service 2024).

SWCA also reviewed historic architecture data provided by the MI SHPO in April 2023. No previously recorded architectural resources are located within the Project Area; three architectural resources are located in the Study Area (Table 4; Appendix A: Figure 5).

No recorded cemeteries are present in the Project Area; two postcontact cemeteries (Palmyra Village Cemetery and Crane Cemetery) are located within the Study Area (Table 5; Appendix A: Figure 5). Palmyra Village Cemetery was included in the MI SHPO site file data, while Crane Cemetery was identified through archival research of historic topographic maps. Due to the data gap in the MI SHPO site file records since February 2024, it is not clear if Crane Cemetery is still absent from MI SHPO site file records.

Table 4. Previously Recorded Historic Architectural Resources in the Study Area

Site ID	Historic Name	City	NRHP Status	Location
P23943	Palmyra Presbyterian Church	Palmyra	Unevaluated	Study Area
P61449	Bruce Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area
P61451	Scott Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area

Table 5. Previously Recorded Cemeteries in the Study Area

Historic Name	Record Source	Location
Palmyra Village Cemetery	MI SHPO site file data	Study Area
Crane Cemetery	Archival research	Study Area

4.6 Geoarchaeology

Geoarchaeology, which is a multidisciplinary field that incorporates topography, geomorphology, geology, and soils, helps archaeologists to understand how geological processes have influenced the preservation of archaeological sites. Research conducted by Monaghan and Lovis (2005) demonstrates that deeply buried soils have an increased probability of sustaining cultural resources where fluvial deposits overlie alluvial deposits as a result of waterways breaching their banks. Monaghan and Lovis developed a predictive geoarchaeological model that takes these effects into account and classifies an area's likelihood of having cultural resources from Low to High-Very High.

Based on the Monaghan and Lovis (2005) model, the Project Area intersects with areas modeled as having moderate to high potential for deeply buried archaeological deposits (Figure A-6). [redacted] Otherwise, the remainder of the Project Area is largely mapped as exhibiting a low potential for deeply buried archaeological deposits.

[redacted]

4.7 Cultural Resources Context and Potential

The potential of the Project Area to contain cultural resources was developed through examination of the natural and topographical characteristics of the Project Area and available historic-era maps and aerial photographs.

4.7.1 Potential for Precontact Archaeological Sites

[redacted]

4.7.2 Potential for Postcontact Archaeological Sites

[redacted]

5 SUMMARY AND RECOMMENDATIONS

In summary, the records review established that one cultural resources survey has been conducted previously within the Project Area, and two cultural resources surveys have been conducted in the Study Area. These compliance surveys were negative and did not result in the recordation of cultural resources within the Project Area or the Study Area. However, [redacted] None of the archaeological sites within the Project Area have been evaluated for listing in the NRHP. There are no previously recorded architectural resources within the Project Area and three architectural resources in the Study Area. Based on MI SHPO records and a review of the NRHP, there are no NRHP-listed resources located within the Project Area or Study Area.

There is an overall moderate probability for significant precontact archaeological sites and a low to moderate probability for significant postcontact archaeological sites within the Project Area. [redacted]

Should the project require archaeological survey, the geoarchaeological modeling (Monaghan and Lovis 2005) suggests that shovel testing and/or deep testing (e.g., auguring) may be necessary [redacted] Pedestrian survey is a viable survey methodology as long as alluvial soils are confined to the plow zone (e.g., 12 inches [30 centimeters]); the limits of shovel testing is typically 3 feet (1 m).

Based on the MPSC regulations and our communications with the MI SHPO (personal communication, Sarah Surface-Evans and Scott Slagor, January 30, 2025), SWCA recommends initiating consultation with the MI SHPO. SWCA understands that MI SHPO has initiated a new consultation process for projects subject to permitting through the MPSC, and that the MI SHPO will provide expert testimony regarding cultural resources to the MPSC. To initiate the consultation process, the MI SHPO requests developers to complete a consultation application, in coordination with a professional archaeologist and architectural historian, The MI SHPO will provide their recommendations for next steps, including survey and avoidance requirements. SWCA understands that RWE will have 1 year after submittal of the MPSC permit application to obtain the approval of survey reports or recommendations submitted to the SHPO.

In keeping with Public Act 233, which requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC, SWCA recommends this document be provided to the MPSC for review. Approval from the MPSC is required before development within the boundaries of these sites occurs.

6 REFERENCES CITED

Adrian Daily Telegram. 1921. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21190/Palmyra+Township/Lenawee+County+1921/Michigan/. Accessed November 14, 2024.

———. 1928. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/1610467/Palmyra+Township++Raisin+River/. Accessed November 14, 2024.

Albert, Dennis A. 1995. Regional landscape ecosystems of Michigan, Minnesota and Wisconsin: A working map and classification. General Technical Report NC-178. U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota. Available at: https://www.nrs.fs.usda.gov/pubs/gtr/other/gtr-nc178/index.html. Accessed November 1, 2024.

Bureau of Land Management General Land Office. 2024. Original Survey Plat, Township 7 North, Range 4 East, 3rd Principal Meridian. Available at: https://glorecords.blm.gov/details/survey/default.aspx?dm_id=27676&sid=usa5y3jo.a4o#surveyDetailsTabIndex=0. Accessed November 14, 2024.

Cadwell, George D. 1893. Atlas of Lenawee County, Michigan. Geo. D. Cadwell and Company, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21077/Palmyra+Township/Lenawee+County+1893/Michigan/. Accessed November 14, 2024.

Everts and Stewart. 1874. Combination Atlas Map of Lenawee County, Michigan. Everts and Stewart, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/20906/Palmyra+Township/. Accessed November 14, 2024.

Historic Aerials. 2024. Historic Aerials Viewer. Available at: https://www.historicaerials.com/viewer. Accessed November 14, 2024.

Monaghan, G. William, and William A. Lovis. 2005. *Modeling Archaeological Site Burial in Southern Michigan: A Geoarchaeological Synthesis*. Michigan State University Press, East Lansing.

National Park Service. 2024. National Register of Historic Places Database and Research. Available at: https://www.nps.gov/subjects/nationalregister/database-research.htm. Accessed January 13, 2025.

Natural Resources Conservation Service (NRCS). 2022. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. Washington, D.C.

———. 2024. Custom Soil Report. Available at: http://websoilsurvey.nrcs.usda.gov. Accessed December 12, 2024.

Ogle, George A. 1916. Standards Atlas of Lenawee County, Michigan. Geo. A. Ogle Publishers and Engravers, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/22243/Palmyra+Township/Lenawee+County+1916/Michigan/. Accessed November 14, 2024.

Stillwell, Larry N. 2017. *An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project No. 161134) in Palmyra, Lenawee County, Michigan*. Archaeological Consultants of Ossian. On file at the Michigan State Historic Preservation Office, Lansing, Michigan.

U.S. Environmental Protection Agency. 2023. How's My Waterway Viewer. Available at: https://mywaterway.epa.gov/. Accessed November 14, 2024.

U.S. Geological Survey (USGS). 2024. National Geologic Map Database Project TopoView. Available at: https://ngmdb.usgs.gov/topoview/viewer/#14/41.8731/-83.9695. Accessed November 14, 2024.

APPENDIX A

Figures

Figure A-1. Location of the proposed Rouget Road, LLC Area in Michigan.

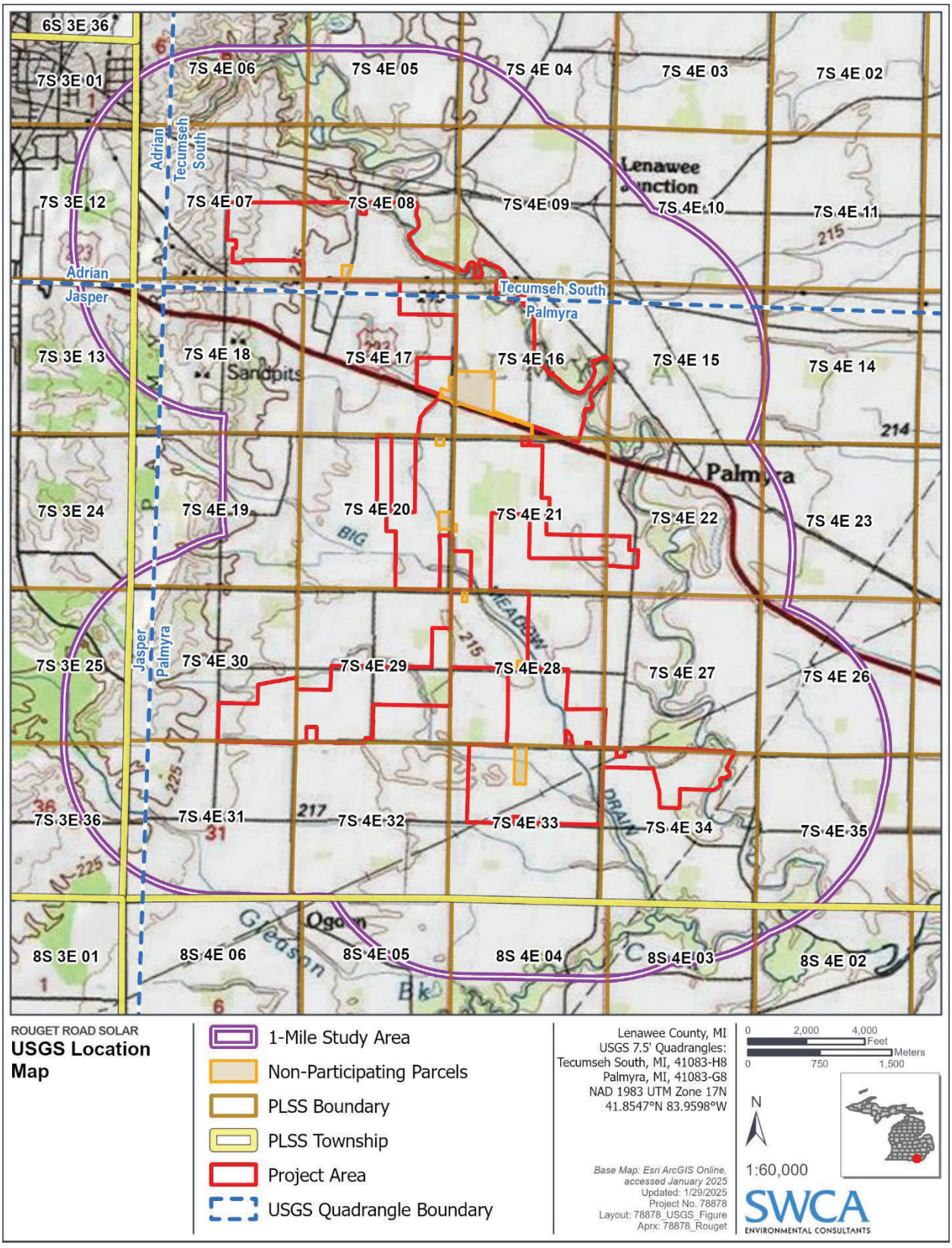

Figure A-2. Location of the Study Area for the proposed Rouget Road, LLC on a USGS topographic map.

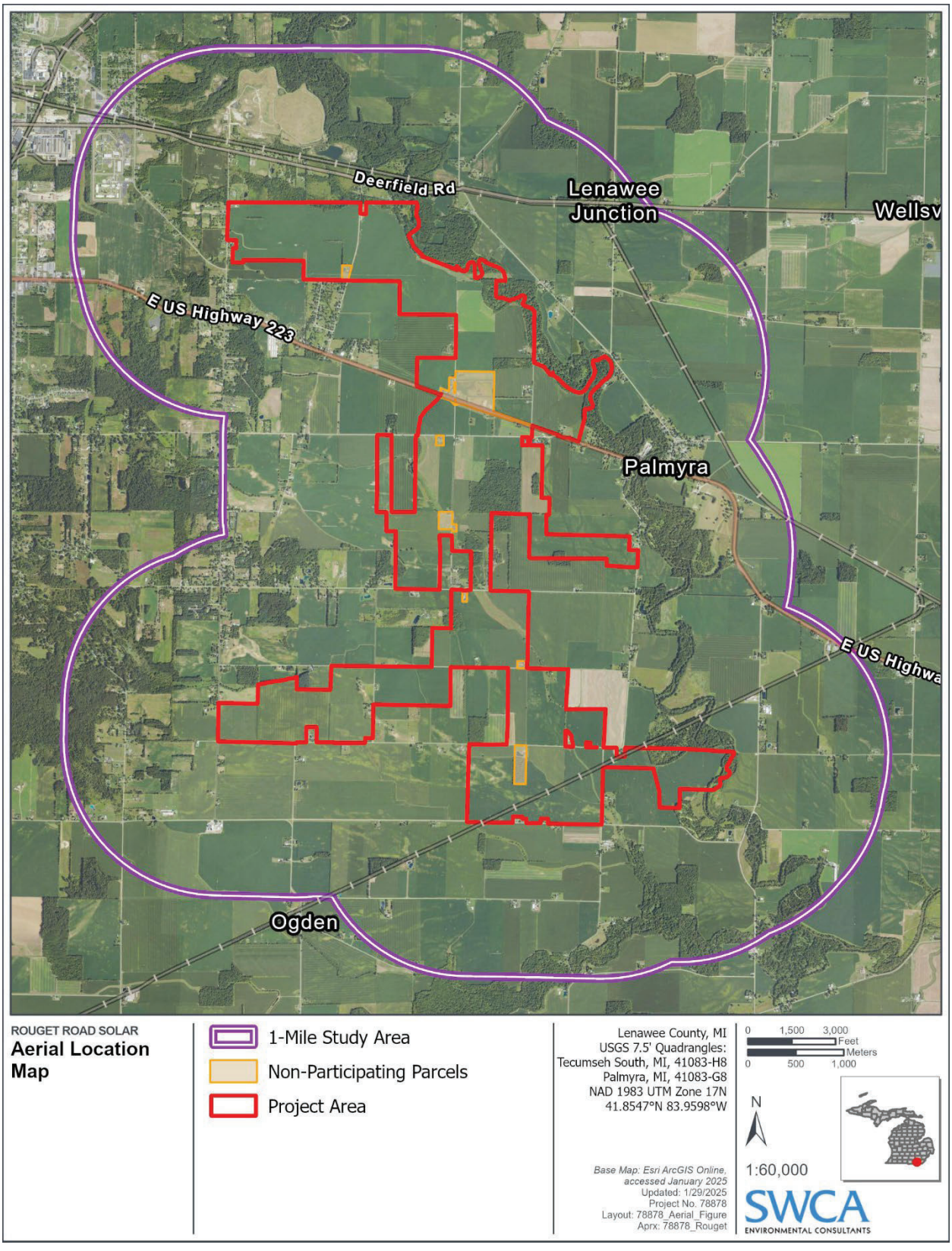

Figure A-3. Overview of the Study Area for the proposed Rouget Road, LLC on aerial imagery.

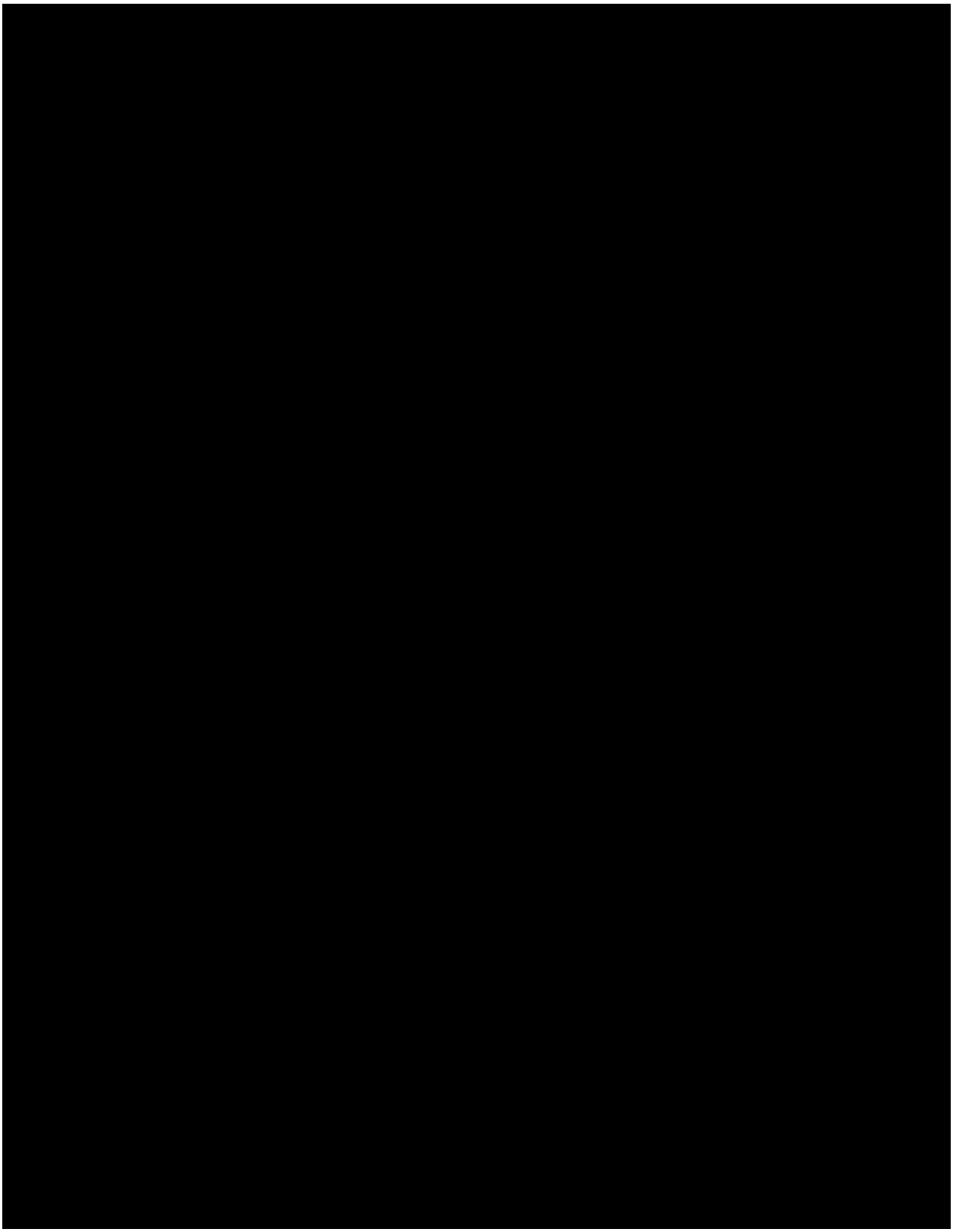

Figure A-4. Results of the background research for previously recorded cultural resources and previously conducted surveys.

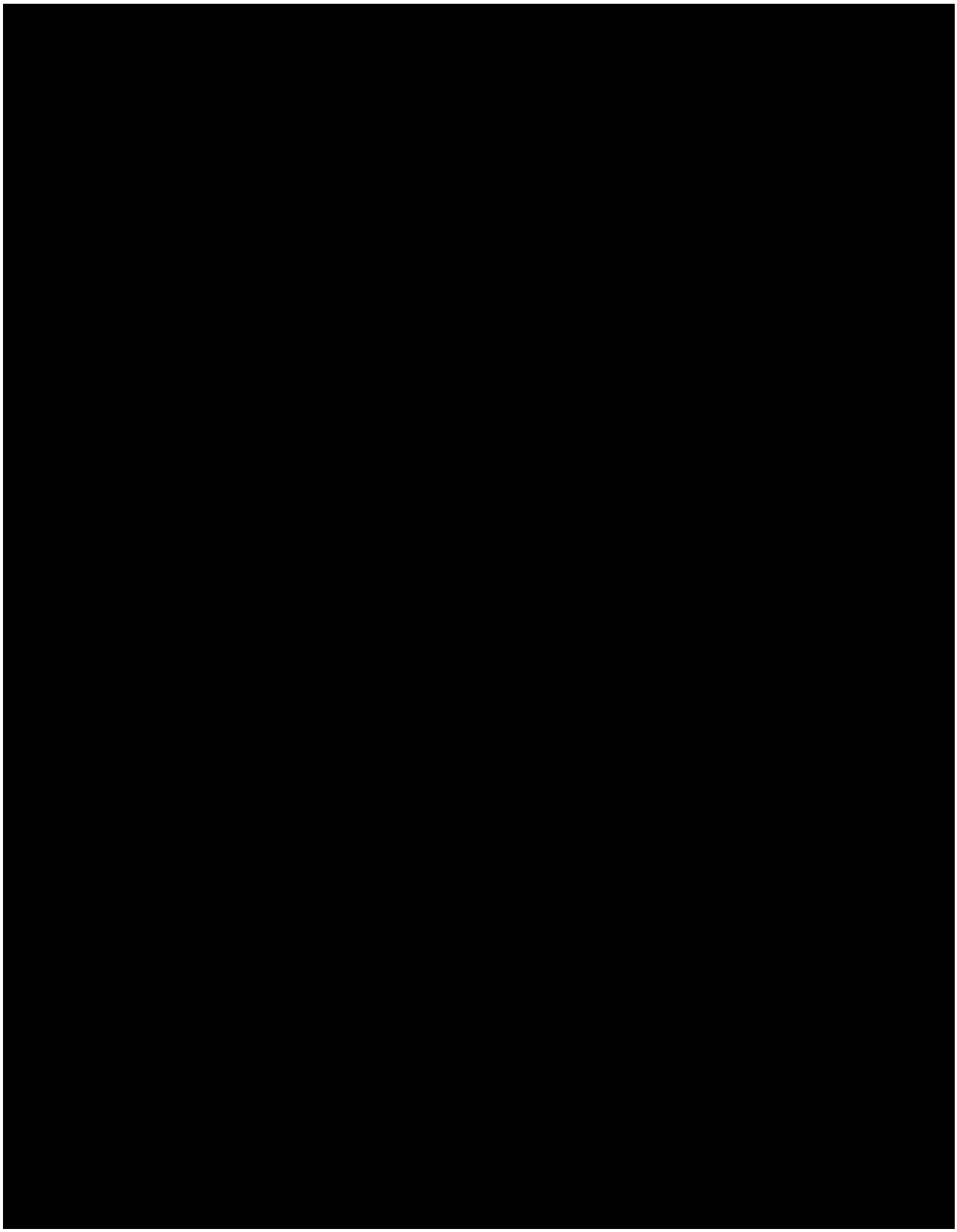

Figure A-5. Results of the background research for postcontact architectural resources and cemeteries.

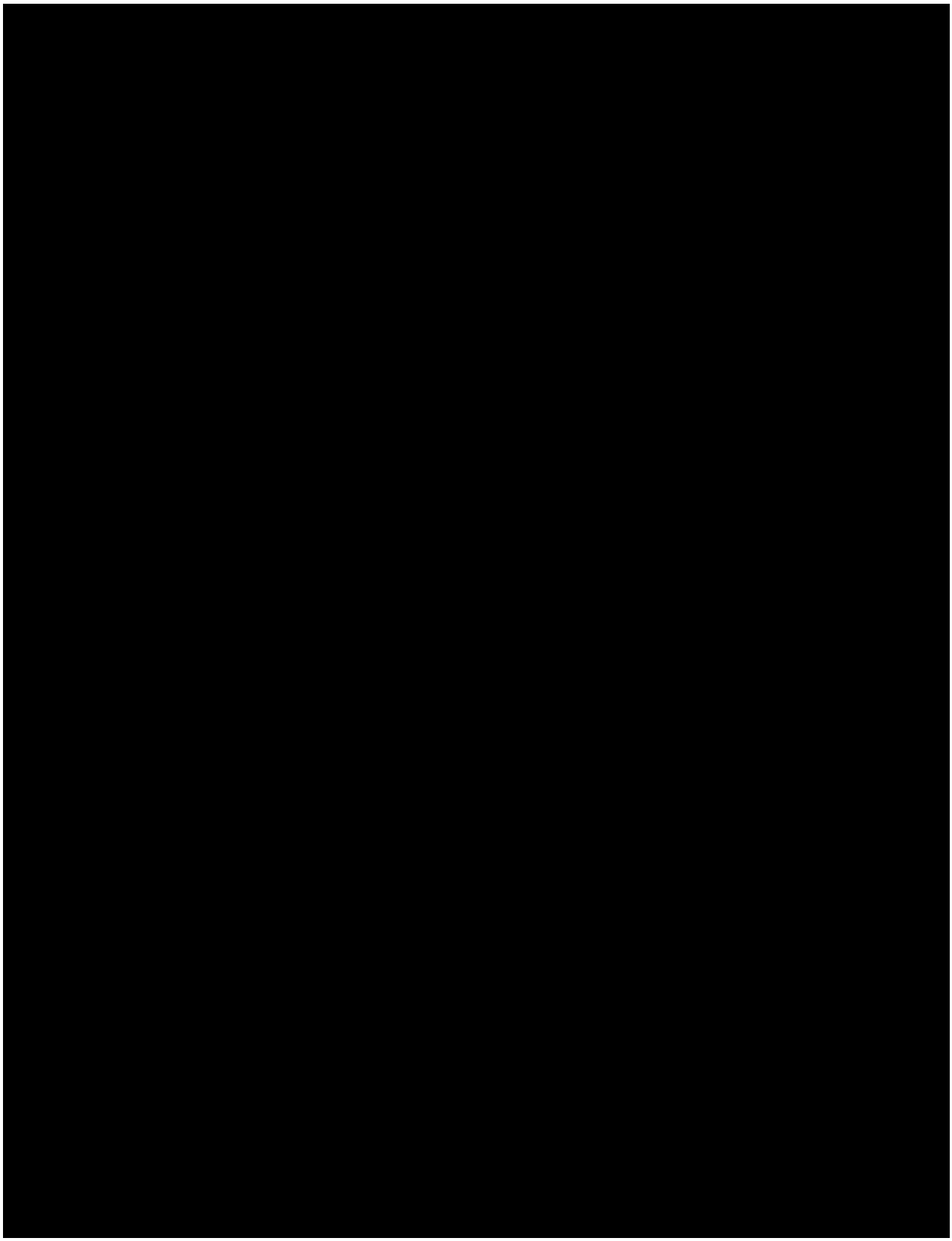

Figure A-6. Areas modeled as having moderate to high potential for deeply buried archaeological deposits in the Project Area and Study Area.

GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
MICHIGAN STRATEGIC FUND
STATE HISTORIC PRESERVATION OFFICE

QUENTIN L. MESSER, JR.
PRESIDENT

September 10, 2025

KEVIN COLE
ROUGET ROAD LLC
10250 PENLAWN DR.
JEROME, MI 49249

RE: SR25-23 PA233 Review Rouget Road, LLC Solar, T07S/R04E/Sec. 7, 8, 9, 15, 16, 17, 20 ,21, 22, 27, 28, 29, 30, 33, and 34, Palmyra Township, Lenawee County (MPSC)

Dear Mr. Cole:

We have received your request for review of the above-cited project under Public Act 233 of 2023 for Renewable Energy and Energy Storage Facility Siting (PA 233) at the above-noted location. We have reviewed the assessment prepared by SWCA, "Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan" and appreciate the information provided. To fully consider and address impacts to cultural and historic sites we require additional information, please send the following:

General

In the materials submitted, the project area boundaries in the submission form and in the Desktop Review do not match. Please ensure that we have the final project boundary maps included in all materials submitted to our office. Desktop Review states that the project plan will avoid archaeological sites, however, the project mapping provided does not make this apparent or clear. We cannot assess the impact of the proposed project on historic resources without accurate mapping information. Additionally, we would like to see the locations of staging areas, vehicle traffic, and any other areas that may have ground disturbance mapped.

Archaeological Resources

Due to the presence of previously documented sites within and near the project area, and the high archaeological sensitivity for the River Raisin valley generally, SHPO requests full archaeological survey for the entire project area, including staging areas. In particular, the boundaries of site 20LE28 are poorly delineated. In order to avoid this site, which is known to contain burials, additional survey methodologies may be necessary beyond pedestrian survey or shovel testing***. SHPO recommends consulting with our office and Tribal Nations with historic connections to this region to develop an appropriate methodology***, which may include geophysical prospection or historic human remains detection dog (HRD) survey. SHPO also recommends developing an Unanticipated Discovery Plan (UDP) for the project. A UDP specifies who will be contacted and what measures will be taken in the event of an unanticipated discovery of archaeological materials or human remains during the project implementation. Please see the UDP template attached, for an example of how these documents are organized. SHPO encourages the project proponent to work with consulting party tribes to develop an

appropriate UDP and protocol for handling human remains.

Above-ground Resources

SHPO concurs with the proposed methodology of utilizing the Above Ground Table in lieu of identification forms except that we require identification forms for properties that are identified as eligible. The table does not provide enough information for eligible properties. For eligible properties, photographs of all resources must also be included in an attachment with Architectural Properties Identification Form. When discussing effects to above-ground resources, please be sure to provide discussion of visual impacts as well as visual barriers in place that may play in to effects determinations. Also be sure that the Historic Resource Survey Report contains enough history and contextual information about the area and resources for SHPO to adequately assess eligibility.

Additional information must be submitted online through our Additional Information Portal.

Please note that our review cannot proceed until we are able to consider the information requested above. This letter is not concurrence. If you have any questions, please contact please contact Senior Archaeologist, Sarah Surface-Evans, surfaceevanss1@michigan.gov, (517) 282-7959 or Historian, Katlyn Burns Yancho, at 517-256-3416, burnsyanchok@michigan.gov. **Please reference our project number in all communication with this office regarding this review.** Thank you for your consultation.

Sincerely,

Sarah Surface-Evans, PhD, RPA
Senior Archaeologist

SES:KAK:KBY:SSE

Enclosure(s): UDP Template

Copy: Anna Gilmer, SWCA

Keweenaw Bay Indian Community of the Lake Superior Band of Chippewa Indians

From:	Jonathan Libbon
To:	"phalverson@kbic-nsn.gov"
Cc:	Carol Mcknight; Aleyda Galan; Cole, J Kevin; Quarles, Mark; Anna Gilmer
Subject:	Rouget Road Solar Consultation Letter
Date:	Thursday, November 20, 2025 5:01:00 PM
Attachments:	Rouget Tribal Consulation LTR_20Nov2025.pdf image001.png
Sensitivity:	Private

Good Afternoon Paul,

On behalf of Rouget Road Solar Farm LLC, a wholly-owned subsidiary of RWE Clean Energy LLC (RWE), we are reaching out to request your input on the Rouget Road Solar Farm Project, a proposed solar facility in Lenawee County, Michigan. The facility will require a state siting certificate from the Michigan Public Service Commission (MPSC). The attached letter and documentation outline the project and provide details on the cultural resource work completed to date. We are seeking comments from your area of expertise regarding any potential environmental or cultural effects associated with this project.

Please let me or Kevin Cole (cc'd), the project manager from RWE, know if you have any questions about the project.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

The contents of this email and any associated emails, information, and attachments are CONFIDENTIAL. Use or disclosure without sender's authorization is prohibited. If you are not an authorized recipient, please notify the sender and then immediately delete the email and any attachments.

11/20/2025

Dear Tribal Historic Preservation Officer and/or Tribal Cultural Representative,

As part of its responsibilities under Michigan Public Act 233 of 2023 (PA 233), *Renewable Energy and Energy Storage Facility Siting*, the Michigan Public Service Commission (MPSC) is seeking consultation (as required in PA 233 Section 224.1b[1]) and determining the area of potential effects ("APE") for the proposed project. Federally listed sovereign Nations with an interest in the state of Michigan are invited to review and comment on Rouget Road Solar Farm, LLC's (Rouget Road Solar Farm) (a wholly-owned subsidiary of RWE Clean Energy LLC [RWE]) proposed **Rouget Road Solar Farm Project** (the "Project"). The proposed Project will require a state-siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC (PA 233 Section 226.7b). Although Rouget Road Solar Farm requests a review and comment on the Project, the MPSC is the state agency and may be communicated with directly.

Based on Michigan State Historic Preservation Office (MI SHPO) guidance from their *Instructions for the Application for PA 233 Renewable Energy Storage Facility Siting Consultation Form*:

> "**Public Act 233** requires the applicant for energy siting and storage facilities to consider and address impacts *to the environment and natural resources, including, but not limited to, sensitive habitats and waterways, wetlands and floodplains, wildlife corridors, parks,* ***historic and cultural sites****, and threatened or endangered species*. The applicant must submit this information to the Michigan Public Service Commission (MPSC) for consideration in permitting the project. In order to facilitate considerations of historic and cultural sites (hereafter Historic Properties), the MPSC has required applicants to consult with the State Historic Preservation Office (SHPO)."

This letter is part of the early coordination phase of the environmental review process, requesting comments associated with this Project. We are requesting comments from your area of expertise regarding any possible environmental or cultural effects associated with this Project. Please provide any additional information you may have regarding potential cultural resources in the Project area so they may be accounted for during the environmental review of this Project. This information can be provided directly to RWE or the MPSC.

Project Description

The proposed Project is southeast of the city of Adrian, in Palmyra Township, Lenawee County, Michigan (Figure 1). Historic Mapping places the proposed Project area in Sections 7, 8, 9, 15, 16, 17, 20, 21, 22, 27, 28, 29, 30, 33, and 34 of Township 7 South, Range 4 East as seen on the enclosed USGS 7.5 series for Tecumseh South and Palmyra, Michigan Topographic Quadrangle map (Figure 2). Rouget Road Solar Farm is proposing to construct a 175-megawatt (MW) alternating current (AC) solar photovoltaic power generating facility. The leased area/Project area boundary includes approximately 2,142 acres (867 hectares) (Figures 2 and 3). Construction will require 1,513 acres (612 ha) of what is currently primarily agricultural land (see site plan boundary in Figure 1). Limited tree removal is planned across 7.96 acres (3.22 ha). Proposed work required for the Project includes construction of a switchyard, substations, access

[1] Sections refer to those found at: https://www.legislature.mi.gov/documents/2023-2024/publicact/htm/2023-PA-0233.htm

roads, fencing, MV electrical cabling, and solar panel structures. Construction may also include an operations and maintenance building.

Project Permitting
The proposed Project will require a siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC.

PA 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 MW or more, to wind projects with a capacity of 100 MW or more, and energy storage facilities with a capacity of 50 MW or more. Projects that fall into these categories must identify and provide information on the effects of the Project on environmental, natural, and cultural resources. Additional PA 233 information is available online at State Project Reviews | MiPlace[2], and a Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the MPSC is available online at Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the Michigan Public Service Commission. [3]

Cultural Resource Investigations
The APE is the area in which the proposed Project may cause alterations in the character or use of historic resources. As the site plan boundary includes all locations that may be impacted by ground disturbing activities related to the project undertaking, it is considered the physical APE (see Figure 1). The visual APE for assessing visual effects to historic-age resources is a 0.5-mile buffer from the boundaries of the Project area (e.g., leased area/project boundary) (see Figure 2). This boundary will be modified based on visual intrusions that may obscure the project.

Rouget Road Solar Farm has contracted SWCA Environmental Consultants (SWCA) to conduct the archaeological and architectural history surveys. Due to the presence of previously--documented archaeology sites in and near the Project area, and the archaeological sensitivity for the River Raisin Valley, SWCA will conduct a full archaeological survey for the physical APE, including staging areas. The boundaries of [redacted], is mapped as lying within the proposed Project area; however, these site boundaries are mapped based off archival records and the extent of the complex is poorly understood. In order to be sensitive toward this [redacted], we are asking for your input on the extent of the complex and the survey methodologies that may be necessary beyond [redacted] An Unanticipated Discoveries Plan (Exhibit A-1.14 in the MPSC permit application) has been prepared.

Summary of Requested Action
We look forward to consulting with your office on this Project and to a continued dialogue. We ask that you provide any comments regarding the Project area following your review of the enclosure. Please use the above Project name and Project description in your reply.

In summary, the MPSC and Rouget Road Solar Farm are requesting Tribal Governments to:

[2] https://www.miplace.org/historic-preservation/programs-and-services/cultural-resource-management-and-planning/state-project-reviews/

[3] https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/consumer/MPSC_Tribal_Involvement_Guide.pdf?rev=399582a67fbe46e883e6f21d1325e785&hash=AA471378E81539AFBBA758AB04FB3D25

1. Review the Project information.
2. Identify cultural or environmental concerns.
3. Provide feedback on archaeological methodologies (especially near site 20LE28).
4. Ensure that any cultural resources are addressed in the MPSC permitting process.

All comments will be documented and considered in Project design and the forthcoming MPSC state siting process. Consultation with SHPO and the THPOs included in the distribution list below will be incorporated into the cultural survey plan, recordation, and design updates as needed. Your timely response will greatly help us incorporate your concerns into the development of the Project. For that purpose, we request that you provide comments by December 20, 2025.

Tribal consulting parties may respond to myself (Kevin Cole) at rougetroadsola@rwe.com with any comments or concerns. Alternatively, you can reach out directly to Gustavo Cordero at the MPSC at corderog@michigan.gov.

Respectfully,

Kevin Cole
RWE Development Manager
rougetroadsola@rwe.com

cc: Gustavo Cordero, Michigan Public Service Commission
Carol McKnight, SWCA Environmental Consultants
Anna Gilmer, SWCA Environmental Consultants

Distribution List:
Forest County Potawatomi Community, Wisconsin
Hannahville Indian Community, Michigan
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
Little Traverse Bay Bands of Odawa Indians, Michigan
Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan
Menominee Indian Tribe of Wisconsin
Miami Tribe of Oklahoma
Pokagon Band of Potawatomi Indians, Michigan and Indiana
Sault Ste. Marie Tribe of Chippewa Indians, Michigan
Seneca-Cayuga Nation

Enclosures:
1. Figures
    a. Figure 1: State location map
    b. Figure 2: Portions of the USGS 7.5' series Tecumseh South and Palmyra Michigan Topographic Quadrangles showing the Project area.
    c. Figure 3: Aerial view of the Project area location in Palmyra Township, Lenawee County, Michigan.
2. Cultural Desktop Report
3. SHPO PA233 Response

Figure 1. Location of the proposed Rouget Road Solar Project Area in Michigan.

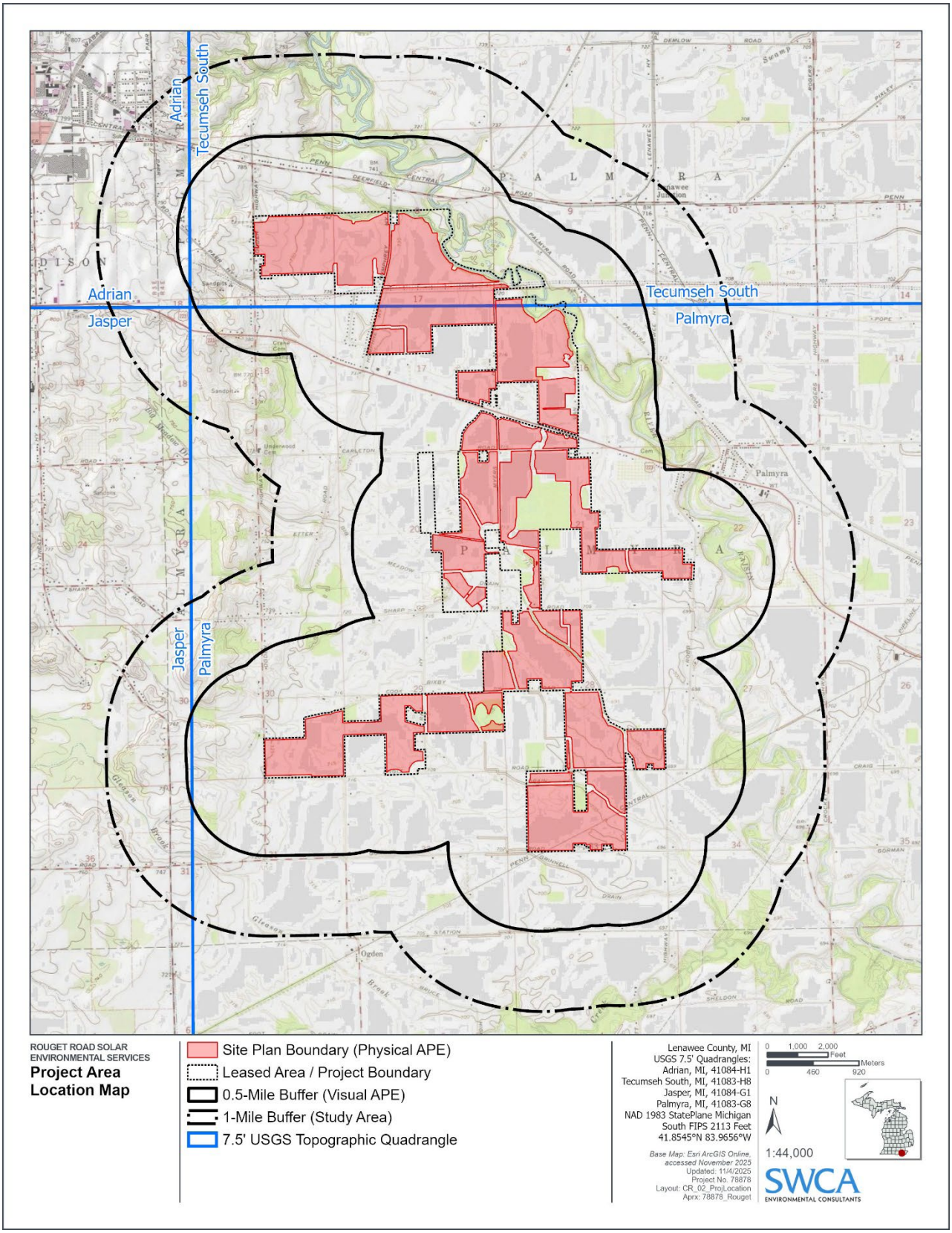

Figure 2. Portions of the USGS 7.5' series Tecumseh South and Palmyra, Michigan Topographic Quadrangles showing the site plan boundary and leased area/Project boundary.

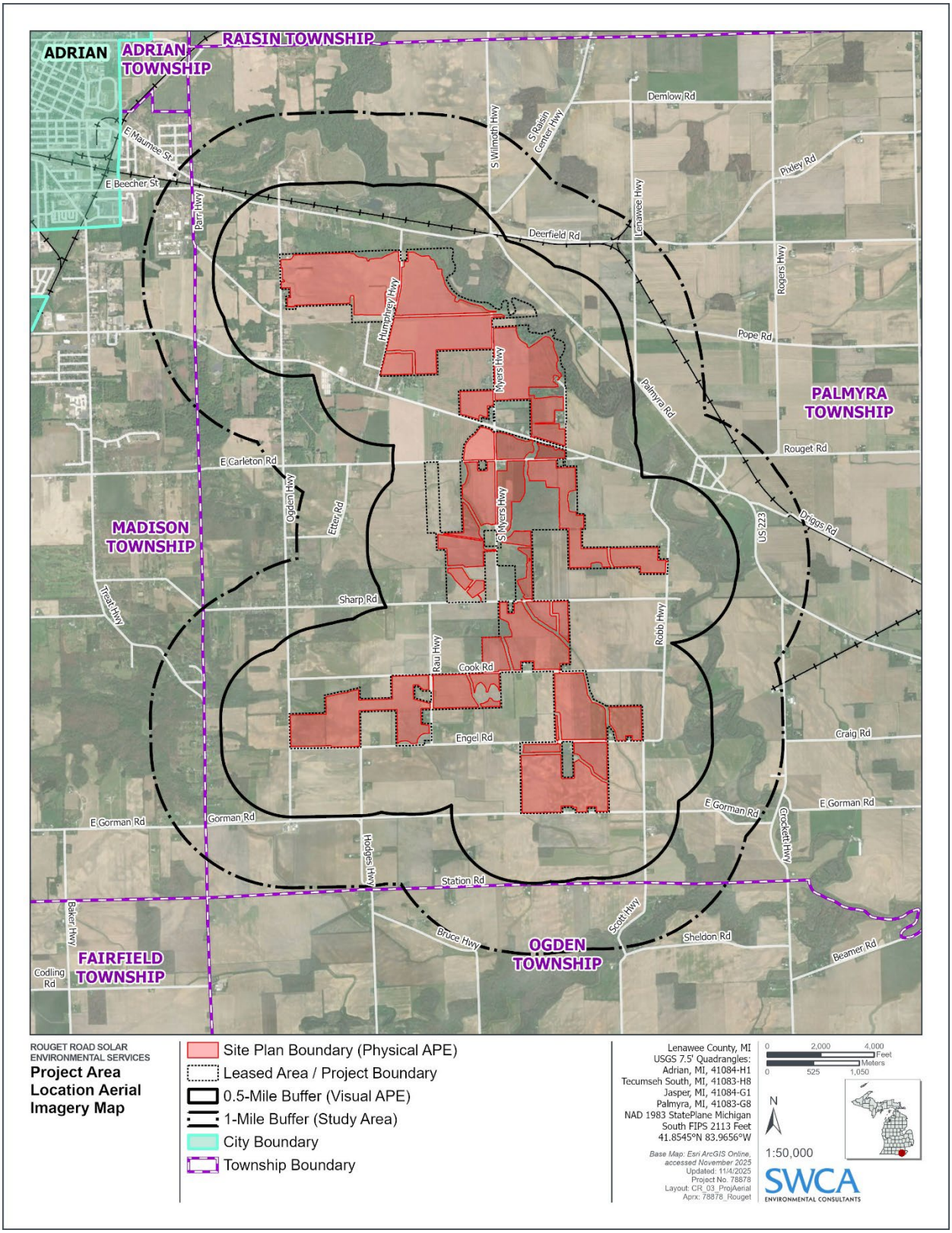

Figure 3. Aerial view showing the site plan boundary and leased area/Project boundary in Palmyra Township, Lenawee County, Michigan.

Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan

JANUARY 2025

PREPARED FOR

Rouget Road, LLC

PREPARED BY

SWCA Environmental Consultants

CULTURAL RESOURCES DESKTOP REVIEW FOR THE ROUGET ROAD, LLC LENAWEE COUNTY, MICHIGAN

Prepared for

Rouget Road, LLC
353 North Clark Street, 30th Floor
Chicago, Illinois 60654
Attn: J Kevin Cole

Prepared by

Rachel Lawrence, M.A., RPA
Heather MacIsaac, B.A.

and

Anna Gilmer, M.A., RPA

SWCA Environmental Consultants
200 22nd Street, Suite 220
Lombard, Illinois 60148
(630) 705-1762
www.swca.com

SWCA Project No. 78878

SWCA Cultural Resources Report No. 25-27

January 2025

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1 INTRODUCTION

SWCA Environmental Consultants (SWCA) completed a cultural resources desktop review for the proposed Rouget Road, LLC (project), located in Lenawee County, Michigan (Figure A-1 in Appendix A). The Project Area spans approximately 2,490 acres (1,008 hectares) of privately owned land near the towns of Adrian, Palmyra, and Ogden. SWCA completed the desktop review for the Project Area plus a surrounding 1.0-mile (1.6-kilometer) buffer around the Project Area. The surrounding 1.0-mile buffer is henceforth referred to as the Study Area (Figures A-2 and A-3).

The objective of the desktop review was to identify existing cultural resources within the Project Area and Study Area to inform project facility siting. Additionally, the Study Area was evaluated to gain an understanding of the type and density of cultural resources in the vicinity of the Project Area. This report summarizes the methods SWCA used to complete the desktop review and presents the results of the background research. It does not serve as Section 106 clearance for the proposed project.

2 REGULATORY FRAMEWORK

Projects in Michigan can come under the purview of two primary cultural resources regulations, the National Historic Preservation Act (NHPA) and Michigan's Natural Resources and Environmental Protection Act. Both are administered by the Michigan State Historic Preservation Office (MI SHPO).

If the project is deemed a federal undertaking (requiring a federal permit, license, or approval; being located on federally owned or managed land; or receiving federal financial assistance), a cultural resources survey most likely would be mandated to ensure compliance with Section 106 of the NHPA. The scope of required cultural resources surveys would then be determined by the functioning federal lead agency in cooperation with the MI SHPO and, if applicable, the pertinent Tribal Historic Preservation Offices as defined in both Section 101 of the National Environmental Policy Act and Section 106 of the NHPA.

Under Michigan law, the state oversees all archaeology performed on state land. The Natural Resources and Environmental Protection Act (Public Act 451 of 1994, Part 761) requires that a permit be obtained prior to undertaking any archaeological investigation on state land.

Public Act 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 megawatts or more, to wind projects with a capacity of 100 megawatts or more, and to energy storage facilities with a capacity of 50 megawatts or more. Public Act 233allows developers the option of applying to the Michigan Public Service Commission (MPSC) to construct utility-scale renewable energy facilities if the local unit of government does not have a compatible renewable energy ordinance. If a compatible renewable energy ordinance is in place, the developer must apply with the local unit of government first, but if the project is denied, the developer may submit to the MPSC for approval. Projects that fall into these categories must identify and provide information on the effects of the project on environmental, natural, and cultural resources.

The project will occur solely on privately held land; thus, no state or local laws requiring archaeological investigations or surveys are anticipated to apply for this project. However, Public Act 233 requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC.

3 METHODOLOGY

SWCA initially submitted a request for in-person research to the MI SHPO on April 7, 2023. Staff at the MI SHPO approved the request and scheduled a research appointment for April 20, 2023. An SWCA archaeologist obtained information in person on previous cultural resources surveys, previously recorded archaeological resources, and previously recorded postcontact architectural resources within the Study Area.

As the Project Area and Study Area were revised in fall 2024, SWCA submitted a second request to the MI SHPO for archaeology and survey site files within the revised Study Area. MI SHPO provided all available records on December 9, 2024. Due to the ongoing updates to the MI SHPO's database, a process that was initiated on February 24, 2024, only archaeology files are currently available. Postcontact architecture files and both postcontact architectural and archaeological survey reports are not currently available as the MI SHPO are scanning these files for upload into a new database. As such, SWCA relied on the April 2023 postcontact architectural resource files and survey reports for this review. SWCA additionally reviewed the National Register of Historic Places (NRHP) database for Michigan as the best available recent data regarding architectural resources.

In addition to the site file search, SWCA investigated historic plat and topographic maps and historic aerial imagery of the Project Area and Study Area. SWCA also researched environmental factors such as modern and historic land use and soil units mapped by the Natural Resources Conservation Service (NRCS) to determine the likelihood of the project to encounter previously unrecorded precontact or postcontact archaeological resources.

4 RESULTS

4.1 Physiography, Geology, and Soils

The Project Area is situated within the Erie-Huron Lake Plain of the Eastern Lake section of the Central Lowland province of the Interior Plains (NRCS 2022:343). The Erie-Huron Lake Plain is a fairly level glacial lake plain with scattered sandy ridges formed by former shorelines and moraines. Elevation ranges from approximately 570 to 815 feet (175 to 250 meters [m]), whereas local relief averages 10 feet (3 m). Major confluences in the Erie-Huron Lake Plain include the Clinton, Huron, and Saginaw Rivers, which empty into the Great Lakes. The Project Area is located within the Floodwood Creek-River Raisin watershed and the Big Meadow Drain-Black Creek watershed, which empty into the River Raisin (U.S. Environmental Protection Agency 2023). Mississippian- to Silurian-age limestone, shale, and dolomite are common along the surface and along the shores of Lake Erie and Lake Huron. Broad, level, and somewhat poorly drained lake plains feature American beech, sugar maple, silver maple, green ash, pin oak, swamp white oak, and American elm, whereas sandy areas feature eastern white pine, eastern hemlock, and other coniferous trees (NRCS 2022:344).

This ecoregion is also part of the Maumee Lake Plain and the Ann Arbor Moraines sub-subsections. The Maumee Lake Plain is a broad, flat, glaciated clay lake plain with rich, loamy soils deeply mantled by till and outwash and dissected by broad glacial drainageways containing sandy soils (Albert 1995). This region formerly included beech-sugar maple forest, elm-ash forest, deciduous swamps, white oak-black oak savannas, wet prairies, and coastal marshes, but now has been largely cultivated (Albert 1995; NRCS 2022). The Ann Arbor Moraines sub-subsection is a long, narrow band of fine- and medium-textured end and ground moraine bordered by flat lake plain on the east and by sandy outwash, end moraine, and ice-contact features to the west. This region formerly supported oak and oak-hickory forests, with oak

savannas along the western edge (Albert 1995). Major wildlife species in the Erie-Huron Lake Plain area include white-tailed deer; cottontail rabbits; squirrels; raccoons; pheasants; bobwhite quail; songbirds; various species of snakes, frogs, and turtles; sunfish; perch; bass; walleye; catfish; carp, sucker; and northern pike.

There are 40 soil series mapped within the Project Area by the NRCS (Table 1). The soils range from very poorly drained to excessively drained loams to sandy loams. The most common soils for the Project Area include Brady and Macomb loams, 0 to 3 percent slopes; Colwood very fine sandy loam, 0 to 3 percent slopes; Wauseon loam, 0 to 3 percent slopes; Ziegenfuss clay loam, 0 to 1 percent slopes; Brady and Macomb sandy loams, 0 to 3 percent slopes; and Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes. These soil types, and their implication for site formation processes and archaeological potential, are discussed further in Section 4.6.

Table 1. Soils within the Project Area

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
BbA	Berrien loamy sand, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BbB	Berrien loamy sand, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcA	Berrien sandy loam, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcB	Berrien sandy loam, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BhA	Brady sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on strand plains	Loamy over sandy and gravelly glaciofluvial deposits
BkA	Brady and Macomb loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BnA	Bronson sandy loam, 0 to 3 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BnB	Bronson sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BoA	Brookston loam, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
CbB	Cadmus sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over loamy till
CeA	Colwood very fine sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CgA	Conover loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Loamy till
GbA	Genesee sandy loam, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
GcA	Genesee and Eel loams, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GgA	Griffin and Sloan loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Clayey till
KbC	Kendallville sandy loam, 7 to 15 percent slopes	Well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over till
KeA	Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on deltas	Stratified loamy glaciofluvial deposits
LcA	Linwood muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Wood organic material over loamy till
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Drainageways on till-floored lake plains	Sandy and/or loamy glaciofluvial deposits over loamy till
NaA	Nappanee silt loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Clayey till
NbB	Nappanee loam, 3 to 7 percent slopes	Somewhat poorly drained	Knolls on ground moraines	Clayey till
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	Somewhat poorly drained	Knolls on ground moraines	Clayey till
OcC	Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded	Excessively drained	Beaches on till-floored lake plains	Glaciofluvial deposits and/or sandy glaciolacustrine deposits over loamy till
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	Poorly drained	Depressions on till plains	Loamy till
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PdB	Plainfield and Berrien loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PeB	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PwmaaA	Pewamo clay loam, dense substratum, 0 to 1 percent slopes	Poorly drained	Drainageways on nearshore zones (relict), flats on nearshore zones (relict)	Clayey till over dense till
RbA	Rollin muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Herbaceous organic material over marl
SbA	Sebewa sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on glacial drainage channels	Loamy over sandy and gravelly glaciofluvial deposits
Sf	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	Poorly drained	Drainageways on stream terraces, drainageways	Loamy drift over sandy and gravelly outwash
WcA	Wauseon loam, 0 to 3 percent slopes	Poorly drained	Depressions on till-floored lake plains	Glaciolacustrine deposits over clayey till

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	Poorly drained	Wave-worked till plains	Clayey till over loamy till
W	Water	N/A	N/A	N/A

Source: NRCS (2024).

4.2 Historical Land Use

SWCA reviewed historic plat and topographic maps, as these sources provide information on past land use within the Project Area and Study Area that may indicate the probability of encountering significant precontact and postcontact cultural resources in or near the Project Area. The historic maps indicate that there has been a general consistency in the road network and land-use patterns from the late nineteenth century into the modern era in the Study Area.

The earliest available map of the Project Area is an 1819 General Land Office survey map (Bureau of Land Management General Land Office 2024). The Project Area is uninhabited. The River Raisin is drawn as a winding water course east of the Project Area. There are patches of marshlands, and tributaries are marked but not fully drawn. No structures are depicted. Palmyra and Lenawee Junction have not yet been established.

The first available plat map, dated 1874, shows that the Project Area and Study Area had been divided into large landholdings. Residences, schools, and churches are depicted. Roads and three railroads also are in place, including the Lenawee County Railroad and Palmyra Road. The current U.S. Highway 233 is shown as a railroad. Several structures are depicted on landholdings within the Project Area. Some of these structures are adjacent to orchards or small agricultural fields. There are branches of unnamed tributaries flowing throughout the Project Area, one of which is the modern Big Meadow Drain (Everts and Stewart 1874).

By 1893, the Project Area is depicted similarly to the 1874 plat. More landowners have appeared, represented by smaller landholdings, and structures are depicted within the Project Area. The unnamed tributaries are still depicted, running through the central and southern portions of the Project Area (Cadwell 1893).

The 1916 plat map shows an increase in landowners once more as the communities of Lenawee Junction and Palmyra continue to grow. Structures also are depicted on these parcels in the Project Area and are shown mostly along roads. U.S. Highway 233 is depicted as the Toledo Western electric railroad. There is another railroad that runs north-south to the Toledo Western electric railroad, connecting from Adrian to Palmyra within the Project Area. This segment of rail had been a road on the 1874 and 1893 plat maps. Several tributaries also are shown within the Project Area (Ogle 1916).

The 1921 plat map does not show individual structures beyond churches and schools, neither of which are in the Project Area. Landowner names are given, and the road network and railroads appear in the same location as on previous plats (*Adrian Daily Telegram* 1921). The 1928 plat presents the same information (*Adrian Daily Telegram* 1928).

SWCA also reviewed historic topographic maps to determine the land use of the Project Area and Study Area. Four historic topographic maps from 1939 to 1972 show that there has been little development from the early twentieth century to the present (U.S. Geological Survey [USGS] 2024). On the earliest available topographic map (Blissfield, Michigan, 1939, 1958 edition), multiple structures are shown in the

Project Area along roadways. The tributaries shown on the plat maps are named and shown: Big Meadow Drain, Bixby Drain, and Grinnell Drain. The road network and railroads are also depicted. The 1941 Blissfield, Michigan, topographic map reveals a similar image. The 1972 Palmyra, Michigan, and 1972 Tecumseh South, Michigan, topographic quadrangles name most of the roads in the Project Area, and they show that residential development had not increased outside of Palmyra and Adrian. Transmission and telecommunication cables are also depicted (USGS 2024).

A review of 17 aerial photographs taken between 1955 and 2022 indicates that minimal land development occurred within the Project Area and its environs. On the aerial images beginning in 1955, the landscape is agricultural. Isolated farmsteads are visible along roadways outside of Palmyra, Lenawee Junction, and Adrian. Drainages are visible either as scars on the landscape or are lined with trees, as is the River Raisin. There are some stands of trees throughout the Project Area. Between 1955 and 2022, no noticeable changes occur to the land use in the Project Area or Study Area (Historic Aerials 2024).

4.3 Previous Cultural Resources Surveys

A review of MI SHPO records identified one cultural resources survey that was conducted in the Project Area and two cultural resources surveys conducted within the Study Area (Table 2). Project ER00-7.17.161134 was a reconnaissance investigation conducted in 2017 by Archaeological Consultants of Ossian. The survey area covered 0.44 acre of land, and no cultural resources were identified during the survey (Stillwell 2017). Project ER17-391 was conducted for the Howard Street/West Michigan CMAQ and Rehabilitation project; however, the MI SHPO records did not contain information on the surveyors, year, or report title. Project B17-258, identified on quad maps in the MI SHPO research repository as Lauterbur 2016, was a Phase I archaeological survey conducted in support of the replacement of the River Raisin Bridge in Palmyra, Michigan. The MI SHPO records did not include information on the extent of the survey; however, no archaeological sites were identified during the survey.

Table 2. Previous Cultural Resources Surveys in the Study Area

Project ID	Project Name	Survey Year	Surveyors	Report Title	Location
ER00-7.17.161134	G2 Cellular Tower Site Review #161134	2017	Archaeological Consultants of Ossian	*An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project #161134) in Palmyra, Lenawee Conty, Michigan. 17FR29Mi.*	Project Area
ER17-391	Howard Street/ West Michigan CMAQ and Rehabilitation	None recorded	None recorded	None recorded	Study Area
B17-258	Lauterbur 2016	2016	Michigan Department of Transportation	*Archaeological Investigations at US-223 River Raisin Bridge Replacement, Palmyra, Lenawee County.*	Study Area

4.4 Previously Recorded Archaeological Sites

[redacted]

[redacted]

4.5 Previously Recorded Architectural Resources and Cemeteries

SWCA reviewed the National Park Service's NRHP database for Lenawee County, Michigan, regarding information on historic districts, buildings, archaeological sites, and other properties eligible for or listed in the NRHP. The NRHP database did not identify any NRHP-listed resources within the Project Area (National Park Service 2024).

SWCA also reviewed historic architecture data provided by the MI SHPO in April 2023. No previously recorded architectural resources are located within the Project Area; three architectural resources are located in the Study Area (Table 4; Appendix A: Figure 5).

No recorded cemeteries are present in the Project Area; two postcontact cemeteries (Palmyra Village Cemetery and Crane Cemetery) are located within the Study Area (Table 5; Appendix A: Figure 5). Palmyra Village Cemetery was included in the MI SHPO site file data, while Crane Cemetery was identified through archival research of historic topographic maps. Due to the data gap in the MI SHPO site file records since February 2024, it is not clear if Crane Cemetery is still absent from MI SHPO site file records.

Table 4. Previously Recorded Historic Architectural Resources in the Study Area

Site ID	Historic Name	City	NRHP Status	Location
P23943	Palmyra Presbyterian Church	Palmyra	Unevaluated	Study Area
P61449	Bruce Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area
P61451	Scott Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area

Table 5. Previously Recorded Cemeteries in the Study Area

Historic Name	Record Source	Location
Palmyra Village Cemetery	MI SHPO site file data	Study Area
Crane Cemetery	Archival research	Study Area

4.6 Geoarchaeology

Geoarchaeology, which is a multidisciplinary field that incorporates topography, geomorphology, geology, and soils, helps archaeologists to understand how geological processes have influenced the preservation of archaeological sites. Research conducted by Monaghan and Lovis (2005) demonstrates that deeply buried soils have an increased probability of sustaining cultural resources where fluvial deposits overlie alluvial deposits as a result of waterways breaching their banks. Monaghan and Lovis developed a predictive geoarchaeological model that takes these effects into account and classifies an area's likelihood of having cultural resources from Low to High-Very High.

Based on the Monaghan and Lovis (2005) model, the Project Area intersects with areas modeled as having moderate to high potential for deeply buried archaeological deposits (Figure A-6). [redacted] Otherwise, the remainder of the Project Area is largely mapped as exhibiting a low potential for deeply buried archaeological deposits.

[redacted]

4.7 Cultural Resources Context and Potential

The potential of the Project Area to contain cultural resources was developed through examination of the natural and topographical characteristics of the Project Area and available historic-era maps and aerial photographs.

4.7.1 Potential for Precontact Archaeological Sites

[redacted]

4.7.2 Potential for Postcontact Archaeological Sites

[redacted]

5 SUMMARY AND RECOMMENDATIONS

In summary, the records review established that one cultural resources survey has been conducted previously within the Project Area, and two cultural resources surveys have been conducted in the Study Area. These compliance surveys were negative and did not result in the recordation of cultural resources within the Project Area or the Study Area. However, [redacted] None of the archaeological sites within the Project Area have been evaluated for listing in the NRHP. There are no previously recorded architectural resources within the Project Area and three architectural resources in the Study Area. Based on MI SHPO records and a review of the NRHP, there are no NRHP-listed resources located within the Project Area or Study Area.

There is an overall moderate probability for significant precontact archaeological sites and a low to moderate probability for significant postcontact archaeological sites within the Project Area. [redacted]

Should the project require archaeological survey, the geoarchaeological modeling (Monaghan and Lovis 2005) suggests that shovel testing and/or deep testing (e.g., auguring) may be necessary [redacted] Pedestrian survey is a viable survey methodology as long as alluvial soils are confined to the plow zone (e.g., 12 inches [30 centimeters]); the limits of shovel testing is typically 3 feet (1 m).

Based on the MPSC regulations and our communications with the MI SHPO (personal communication, Sarah Surface-Evans and Scott Slagor, January 30, 2025), SWCA recommends initiating consultation with the MI SHPO. SWCA understands that MI SHPO has initiated a new consultation process for projects subject to permitting through the MPSC, and that the MI SHPO will provide expert testimony regarding cultural resources to the MPSC. To initiate the consultation process, the MI SHPO requests developers to complete a consultation application, in coordination with a professional archaeologist and architectural historian, The MI SHPO will provide their recommendations for next steps, including survey and avoidance requirements. SWCA understands that RWE will have 1 year after submittal of the MPSC permit application to obtain the approval of survey reports or recommendations submitted to the SHPO.

In keeping with Public Act 233, which requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC, SWCA recommends this document be provided to the MPSC for review. Approval from the MPSC is required before development within the boundaries of these sites occurs.

6 REFERENCES CITED

Adrian Daily Telegram. 1921. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21190/Palmyra+Township/Lenawee+County+1921/Michigan/. Accessed November 14, 2024.

———. 1928. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/1610467/Palmyra+Township++Raisin+River/. Accessed November 14, 2024.

Albert, Dennis A. 1995. Regional landscape ecosystems of Michigan, Minnesota and Wisconsin: A working map and classification. General Technical Report NC-178. U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota. Available at: https://www.nrs.fs.usda.gov/pubs/gtr/other/gtr-nc178/index.html. Accessed November 1, 2024.

Bureau of Land Management General Land Office. 2024. Original Survey Plat, Township 7 North, Range 4 East, 3rd Principal Meridian. Available at: https://glorecords.blm.gov/details/survey/default.aspx?dm_id=27676&sid=usa5y3jo.a4o#surveyDetailsTabIndex=0. Accessed November 14, 2024.

Cadwell, George D. 1893. Atlas of Lenawee County, Michigan. Geo. D. Cadwell and Company, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21077/Palmyra+Township/Lenawee+County+1893/Michigan/. Accessed November 14, 2024.

Everts and Stewart. 1874. Combination Atlas Map of Lenawee County, Michigan. Everts and Stewart, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/20906/Palmyra+Township/. Accessed November 14, 2024.

Historic Aerials. 2024. Historic Aerials Viewer. Available at: https://www.historicaerials.com/viewer. Accessed November 14, 2024.

Monaghan, G. William, and William A. Lovis. 2005. *Modeling Archaeological Site Burial in Southern Michigan: A Geoarchaeological Synthesis*. Michigan State University Press, East Lansing.

National Park Service. 2024. National Register of Historic Places Database and Research. Available at: https://www.nps.gov/subjects/nationalregister/database-research.htm. Accessed January 13, 2025.

Natural Resources Conservation Service (NRCS). 2022. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. Washington, D.C.

———. 2024. Custom Soil Report. Available at: http://websoilsurvey.nrcs.usda.gov. Accessed December 12, 2024.

Ogle, George A. 1916. Standards Atlas of Lenawee County, Michigan. Geo. A. Ogle Publishers and Engravers, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/22243/Palmyra+Township/Lenawee+County+1916/Michigan/. Accessed November 14, 2024.

Stillwell, Larry N. 2017. *An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project No. 161134) in Palmyra, Lenawee County, Michigan*. Archaeological Consultants of Ossian. On file at the Michigan State Historic Preservation Office, Lansing, Michigan.

U.S. Environmental Protection Agency. 2023. How's My Waterway Viewer. Available at: https://mywaterway.epa.gov/. Accessed November 14, 2024.

U.S. Geological Survey (USGS). 2024. National Geologic Map Database Project TopoView. Available at: https://ngmdb.usgs.gov/topoview/viewer/#14/41.8731/-83.9695. Accessed November 14, 2024.

APPENDIX A

Figures

Figure A-1. Location of the proposed Rouget Road, LLC Area in Michigan.

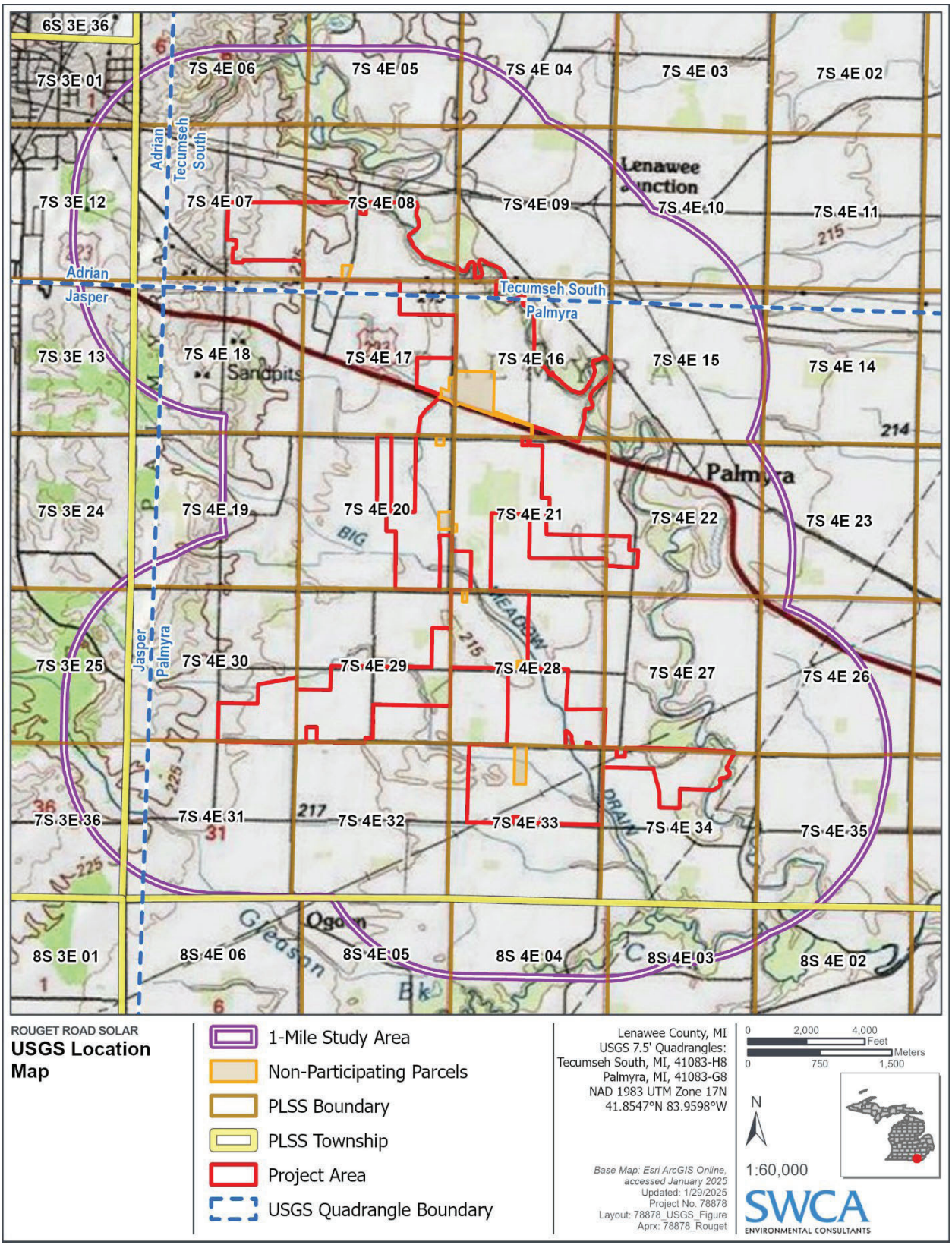

Figure A-2. Location of the Study Area for the proposed Rouget Road, LLC on a USGS topographic map.

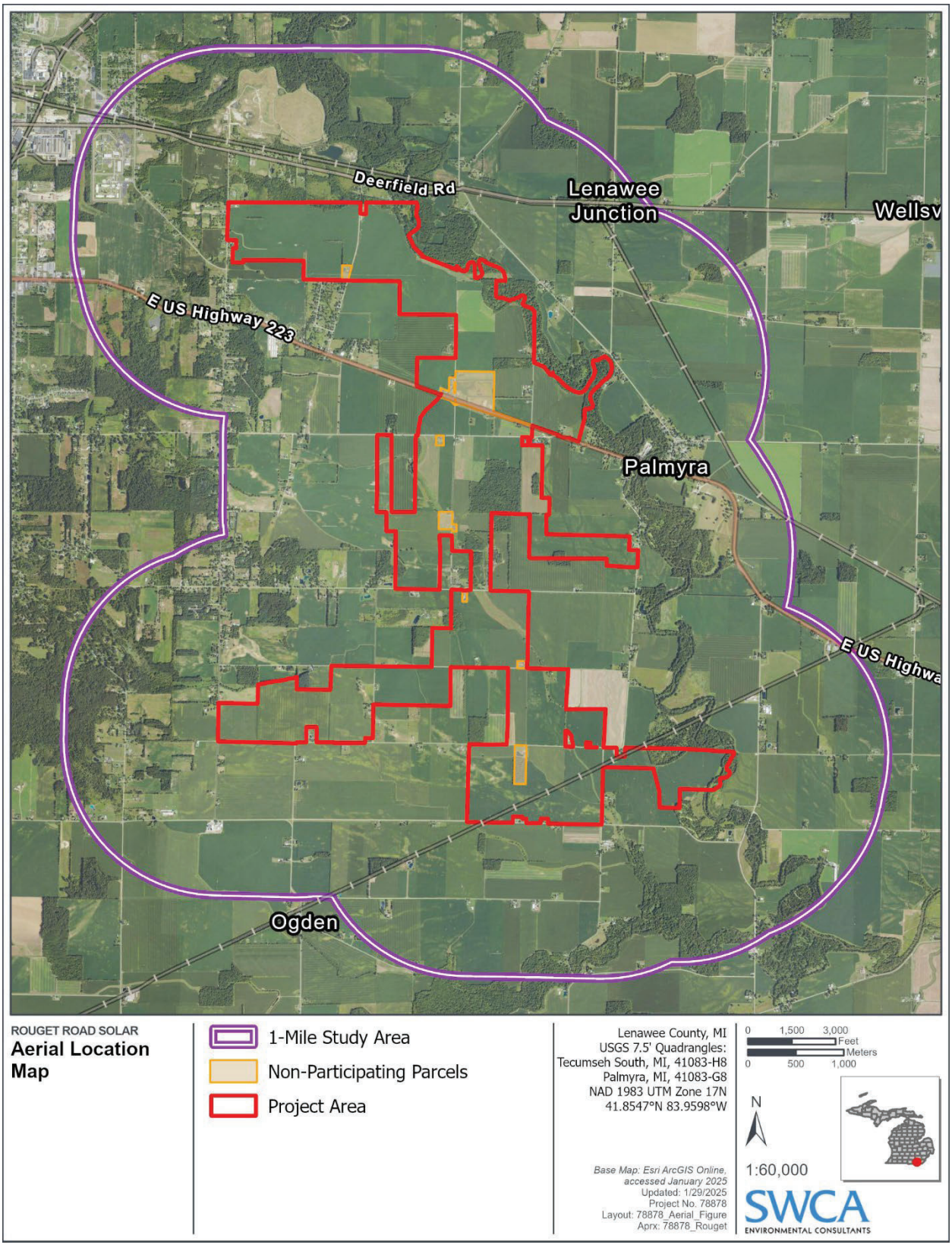

Figure A-3. Overview of the Study Area for the proposed Rouget Road, LLC on aerial imagery.

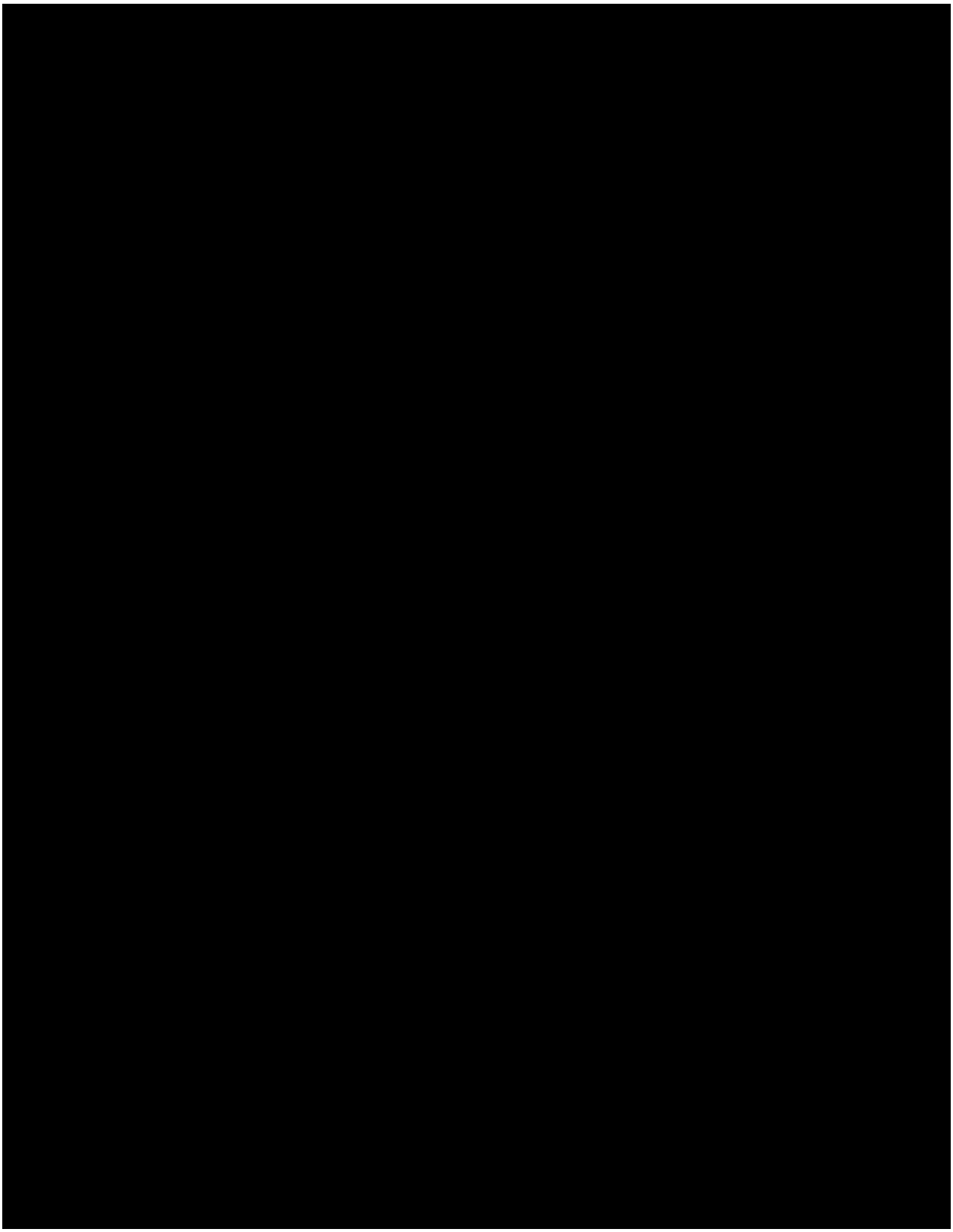

Figure A-4. Results of the background research for previously recorded cultural resources and previously conducted surveys.

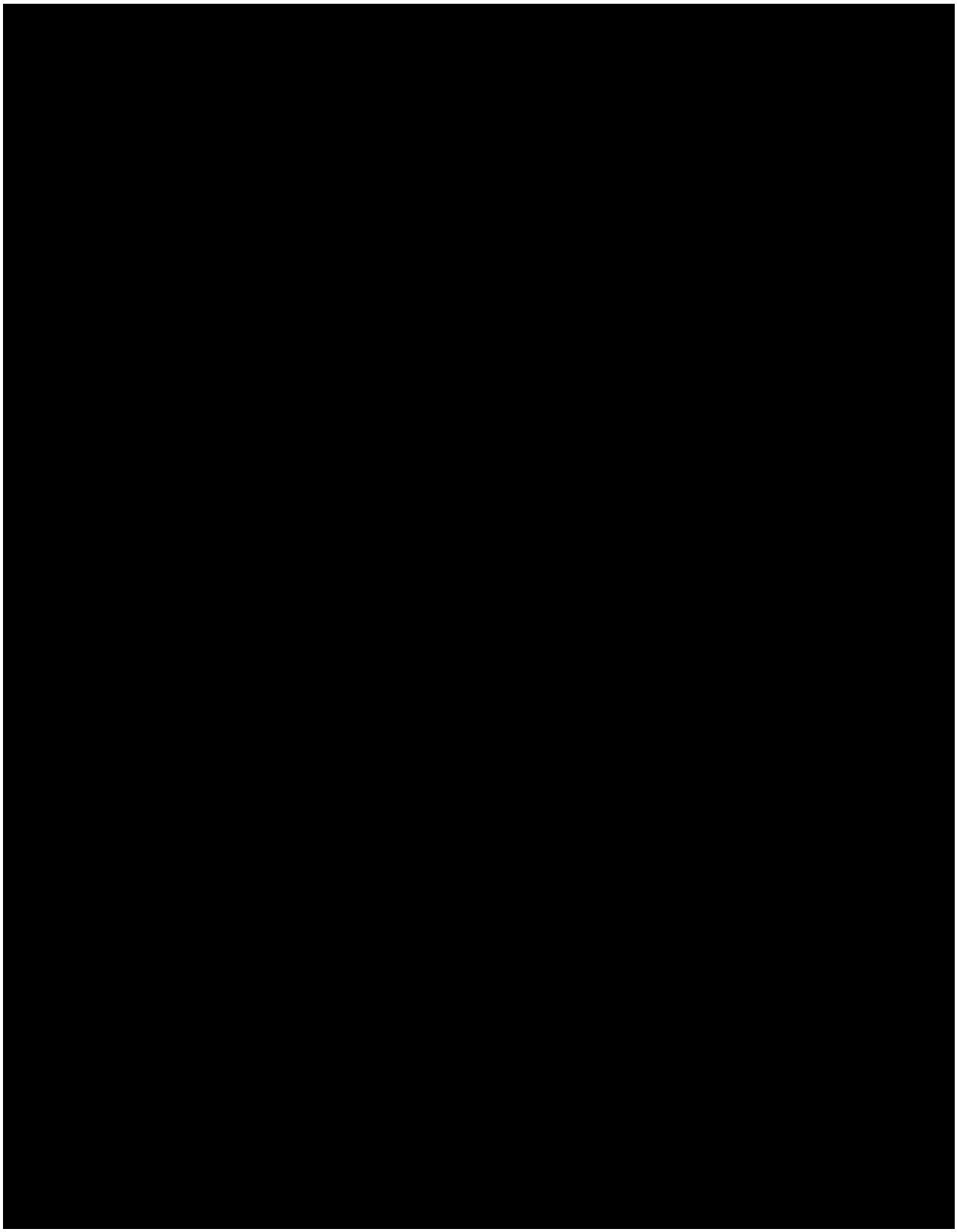

Figure A-5. Results of the background research for postcontact architectural resources and cemeteries.

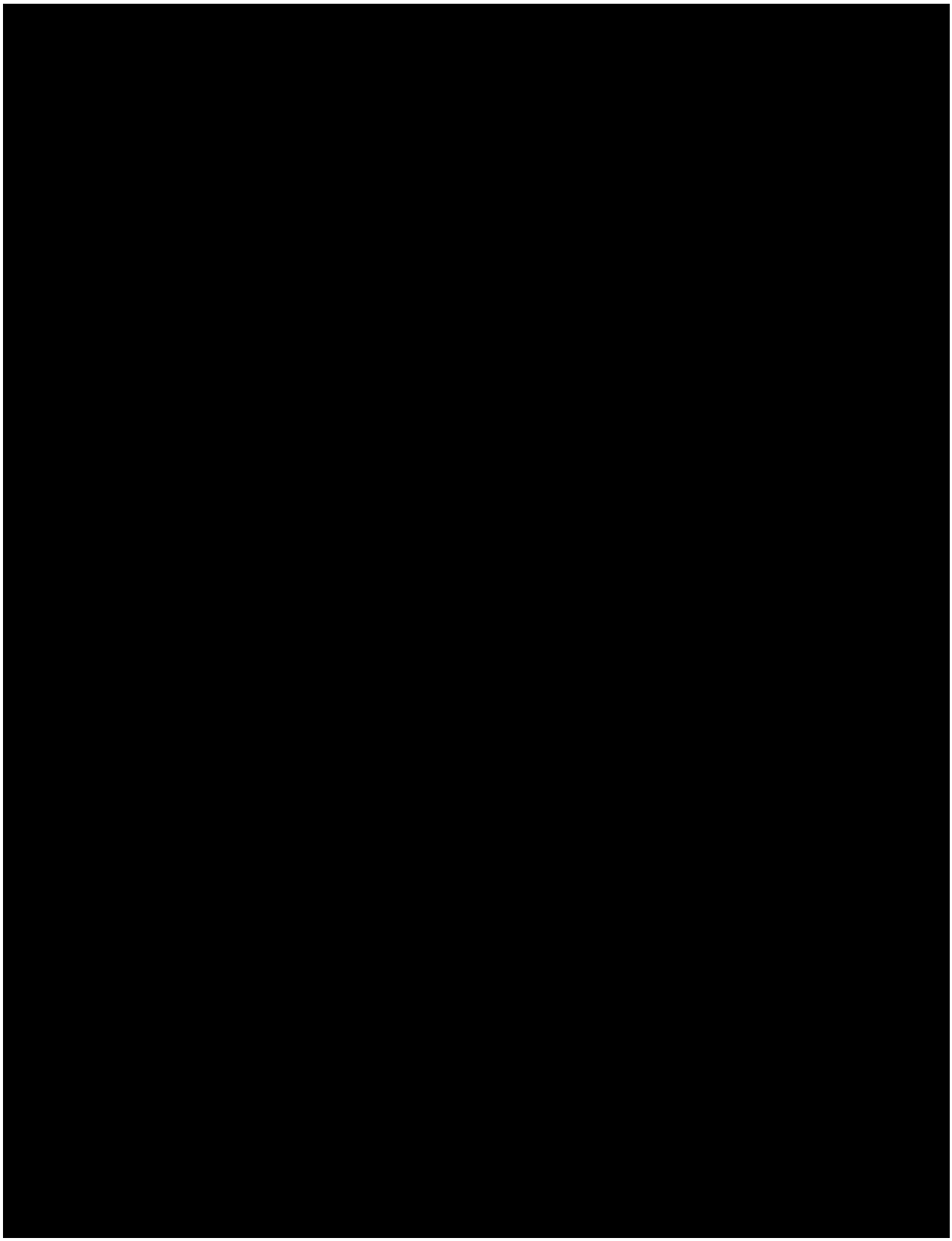

Figure A-6. Areas modeled as having moderate to high potential for deeply buried archaeological deposits in the Project Area and Study Area.

GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
MICHIGAN STRATEGIC FUND
STATE HISTORIC PRESERVATION OFFICE

QUENTIN L. MESSER, JR.
PRESIDENT

September 10, 2025

KEVIN COLE
ROUGET ROAD LLC
10250 PENLAWN DR.
JEROME, MI 49249

RE: SR25-23 PA233 Review Rouget Road, LLC Solar, T07S/R04E/Sec. 7, 8, 9, 15, 16, 17, 20 ,21, 22, 27, 28, 29, 30, 33, and 34, Palmyra Township, Lenawee County (MPSC)

Dear Mr. Cole:

We have received your request for review of the above-cited project under Public Act 233 of 2023 for Renewable Energy and Energy Storage Facility Siting (PA 233) at the above-noted location. We have reviewed the assessment prepared by SWCA, "Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan" and appreciate the information provided. To fully consider and address impacts to cultural and historic sites we require additional information, please send the following:

General

In the materials submitted, the project area boundaries in the submission form and in the Desktop Review do not match. Please ensure that we have the final project boundary maps included in all materials submitted to our office. Desktop Review states that the project plan will avoid archaeological sites, however, the project mapping provided does not make this apparent or clear. We cannot assess the impact of the proposed project on historic resources without accurate mapping information. Additionally, we would like to see the locations of staging areas, vehicle traffic, and any other areas that may have ground disturbance mapped.

Archaeological Resources

Due to the presence of previously documented sites within and near the project area, and the high archaeological sensitivity for the River Raisin valley generally, SHPO requests full archaeological survey for the entire project area, including staging areas. In particular, the boundaries of site 20LE28 are poorly delineated. In order to avoid this site, which is known to contain burials, additional survey methodologies may be necessary beyond pedestrian survey or shovel testing***. SHPO recommends consulting with our office and Tribal Nations with historic connections to this region to develop an appropriate methodology***, which may include geophysical prospection or historic human remains detection dog (HRD) survey. SHPO also recommends developing an Unanticipated Discovery Plan (UDP) for the project. A UDP specifies who will be contacted and what measures will be taken in the event of an unanticipated discovery of archaeological materials or human remains during the project implementation. Please see the UDP template attached, for an example of how these documents are organized. SHPO encourages the project proponent to work with consulting party tribes to develop an

appropriate UDP and protocol for handling human remains.

Above-ground Resources

SHPO concurs with the proposed methodology of utilizing the Above Ground Table in lieu of identification forms except that we require identification forms for properties that are identified as eligible. The table does not provide enough information for eligible properties. For eligible properties, photographs of all resources must also be included in an attachment with Architectural Properties Identification Form. When discussing effects to above-ground resources, please be sure to provide discussion of visual impacts as well as visual barriers in place that may play in to effects determinations. Also be sure that the Historic Resource Survey Report contains enough history and contextual information about the area and resources for SHPO to adequately assess eligibility.

Additional information must be submitted online through our Additional Information Portal.

Please note that our review cannot proceed until we are able to consider the information requested above. This letter is not concurrence. If you have any questions, please contact please contact Senior Archaeologist, Sarah Surface-Evans, surfaceevanss1@michigan.gov, (517) 282-7959 or Historian, Katlyn Burns Yancho, at 517-256-3416, burnsyanchok@michigan.gov. **Please reference our project number in all communication with this office regarding this review.** Thank you for your consultation.

Sincerely,

Sarah Surface-Evans, PhD, RPA
Senior Archaeologist

SES:KAK:KBY:SSE

Enclosure(s): UDP Template

Copy: Anna Gilmer, SWCA

Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan

From:	Jonathan Libbon
To:	"alina.shively@lvd-nsn.gov"
Cc:	Carol Mcknight; Aleyda Galan; Cole, J Kevin; Quarles, Mark; Anna Gilmer
Subject:	Rouget Road Solar Consultation Letter
Date:	Thursday, November 20, 2025 5:01:00 PM
Attachments:	Rouget Tribal Consulation LTR_20Nov2025.pdf image001.png
Sensitivity:	Private

Good Afternoon Alina,

On behalf of Rouget Road Solar Farm LLC, a wholly-owned subsidiary of RWE Clean Energy LLC (RWE), we are reaching out to request your input on the Rouget Road Solar Farm Project, a proposed solar facility in Lenawee County, Michigan. The facility will require a state siting certificate from the Michigan Public Service Commission (MPSC). The attached letter and documentation outline the project and provide details on the cultural resource work completed to date. We are seeking comments from your area of expertise regarding any potential environmental or cultural effects associated with this project.

Please let me or Kevin Cole (cc'd), the project manager from RWE, know if you have any questions about the project.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

The contents of this email and any associated emails, information, and attachments are CONFIDENTIAL. Use or disclosure without sender's authorization is prohibited. If you are not an authorized recipient, please notify the sender and then immediately delete the email and any attachments.

11/20/2025

Dear Tribal Historic Preservation Officer and/or Tribal Cultural Representative,

As part of its responsibilities under Michigan Public Act 233 of 2023 (PA 233), *Renewable Energy and Energy Storage Facility Siting*, the Michigan Public Service Commission (MPSC) is seeking consultation (as required in PA 233 Section 224.1b[1]) and determining the area of potential effects ("APE") for the proposed project. Federally listed sovereign Nations with an interest in the state of Michigan are invited to review and comment on Rouget Road Solar Farm, LLC's (Rouget Road Solar Farm) (a wholly-owned subsidiary of RWE Clean Energy LLC [RWE]) proposed **Rouget Road Solar Farm Project** (the "Project"). The proposed Project will require a state-siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC (PA 233 Section 226.7b). Although Rouget Road Solar Farm requests a review and comment on the Project, the MPSC is the state agency and may be communicated with directly.

Based on Michigan State Historic Preservation Office (MI SHPO) guidance from their *Instructions for the Application for PA 233 Renewable Energy Storage Facility Siting Consultation Form*:

> "**Public Act 233** requires the applicant for energy siting and storage facilities to consider and address impacts *to the environment and natural resources, including, but not limited to, sensitive habitats and waterways, wetlands and floodplains, wildlife corridors, parks,* ***historic and cultural sites****, and threatened or endangered species*. The applicant must submit this information to the Michigan Public Service Commission (MPSC) for consideration in permitting the project. In order to facilitate considerations of historic and cultural sites (hereafter Historic Properties), the MPSC has required applicants to consult with the State Historic Preservation Office (SHPO)."

This letter is part of the early coordination phase of the environmental review process, requesting comments associated with this Project. We are requesting comments from your area of expertise regarding any possible environmental or cultural effects associated with this Project. Please provide any additional information you may have regarding potential cultural resources in the Project area so they may be accounted for during the environmental review of this Project. This information can be provided directly to RWE or the MPSC.

Project Description

The proposed Project is southeast of the city of Adrian, in Palmyra Township, Lenawee County, Michigan (Figure 1). Historic Mapping places the proposed Project area in Sections 7, 8, 9, 15, 16, 17, 20, 21, 22, 27, 28, 29, 30, 33, and 34 of Township 7 South, Range 4 East as seen on the enclosed USGS 7.5 series for Tecumseh South and Palmyra, Michigan Topographic Quadrangle map (Figure 2). Rouget Road Solar Farm is proposing to construct a 175-megawatt (MW) alternating current (AC) solar photovoltaic power generating facility. The leased area/Project area boundary includes approximately 2,142 acres (867 hectares) (Figures 2 and 3). Construction will require 1,513 acres (612 ha) of what is currently primarily agricultural land (see site plan boundary in Figure 1). Limited tree removal is planned across 7.96 acres (3.22 ha). Proposed work required for the Project includes construction of a switchyard, substations, access

[1] Sections refer to those found at: https://www.legislature.mi.gov/documents/2023-2024/publicact/htm/2023-PA-0233.htm

roads, fencing, MV electrical cabling, and solar panel structures. Construction may also include an operations and maintenance building.

Project Permitting
The proposed Project will require a siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC.

PA 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 MW or more, to wind projects with a capacity of 100 MW or more, and energy storage facilities with a capacity of 50 MW or more. Projects that fall into these categories must identify and provide information on the effects of the Project on environmental, natural, and cultural resources. Additional PA 233 information is available online at State Project Reviews | MiPlace[2], and a Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the MPSC is available online at Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the Michigan Public Service Commission. [3]

Cultural Resource Investigations
The APE is the area in which the proposed Project may cause alterations in the character or use of historic resources. As the site plan boundary includes all locations that may be impacted by ground disturbing activities related to the project undertaking, it is considered the physical APE (see Figure 1). The visual APE for assessing visual effects to historic-age resources is a 0.5-mile buffer from the boundaries of the Project area (e.g., leased area/project boundary) (see Figure 2). This boundary will be modified based on visual intrusions that may obscure the project.

Rouget Road Solar Farm has contracted SWCA Environmental Consultants (SWCA) to conduct the archaeological and architectural history surveys. Due to the presence of previously--documented archaeology sites in and near the Project area, and the archaeological sensitivity for the River Raisin Valley, SWCA will conduct a full archaeological survey for the physical APE, including staging areas. The boundaries of [redacted], is mapped as lying within the proposed Project area; however, these site boundaries are mapped based off archival records and the extent of the complex is poorly understood. In order to be sensitive toward this [redacted], we are asking for your input on the extent of the complex and the survey methodologies that may be necessary beyond [redacted] An Unanticipated Discoveries Plan (Exhibit A-1.14 in the MPSC permit application) has been prepared.

Summary of Requested Action
We look forward to consulting with your office on this Project and to a continued dialogue. We ask that you provide any comments regarding the Project area following your review of the enclosure. Please use the above Project name and Project description in your reply.

In summary, the MPSC and Rouget Road Solar Farm are requesting Tribal Governments to:

[2] https://www.miplace.org/historic-preservation/programs-and-services/cultural-resource-management-and-planning/state-project-reviews/

[3] https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/consumer/MPSC_Tribal_Involvement_Guide.pdf?rev=399582a67fbe46e883e6f21d1325e785&hash=AA471378E81539AFBBA758AB04FB3D25

1. Review the Project information.
2. Identify cultural or environmental concerns.
3. Provide feedback on archaeological methodologies (especially near site 20LE28).
4. Ensure that any cultural resources are addressed in the MPSC permitting process.

All comments will be documented and considered in Project design and the forthcoming MPSC state siting process. Consultation with SHPO and the THPOs included in the distribution list below will be incorporated into the cultural survey plan, recordation, and design updates as needed. Your timely response will greatly help us incorporate your concerns into the development of the Project. For that purpose, we request that you provide comments by December 20, 2025.

Tribal consulting parties may respond to myself (Kevin Cole) at rougetroadsola@rwe.com with any comments or concerns. Alternatively, you can reach out directly to Gustavo Cordero at the MPSC at corderog@michigan.gov.

Respectfully,

Kevin Cole
RWE Development Manager
rougetroadsola@rwe.com

cc: Gustavo Cordero, Michigan Public Service Commission
Carol McKnight, SWCA Environmental Consultants
Anna Gilmer, SWCA Environmental Consultants

Distribution List:
Forest County Potawatomi Community, Wisconsin
Hannahville Indian Community, Michigan
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
Little Traverse Bay Bands of Odawa Indians, Michigan
Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan
Menominee Indian Tribe of Wisconsin
Miami Tribe of Oklahoma
Pokagon Band of Potawatomi Indians, Michigan and Indiana
Sault Ste. Marie Tribe of Chippewa Indians, Michigan
Seneca-Cayuga Nation

Enclosures:
1. Figures
    a. Figure 1: State location map
    b. Figure 2: Portions of the USGS 7.5' series Tecumseh South and Palmyra Michigan Topographic Quadrangles showing the Project area.
    c. Figure 3: Aerial view of the Project area location in Palmyra Township, Lenawee County, Michigan.
2. Cultural Desktop Report
3. SHPO PA233 Response

Figure 1. Location of the proposed Rouget Road Solar Project Area in Michigan.

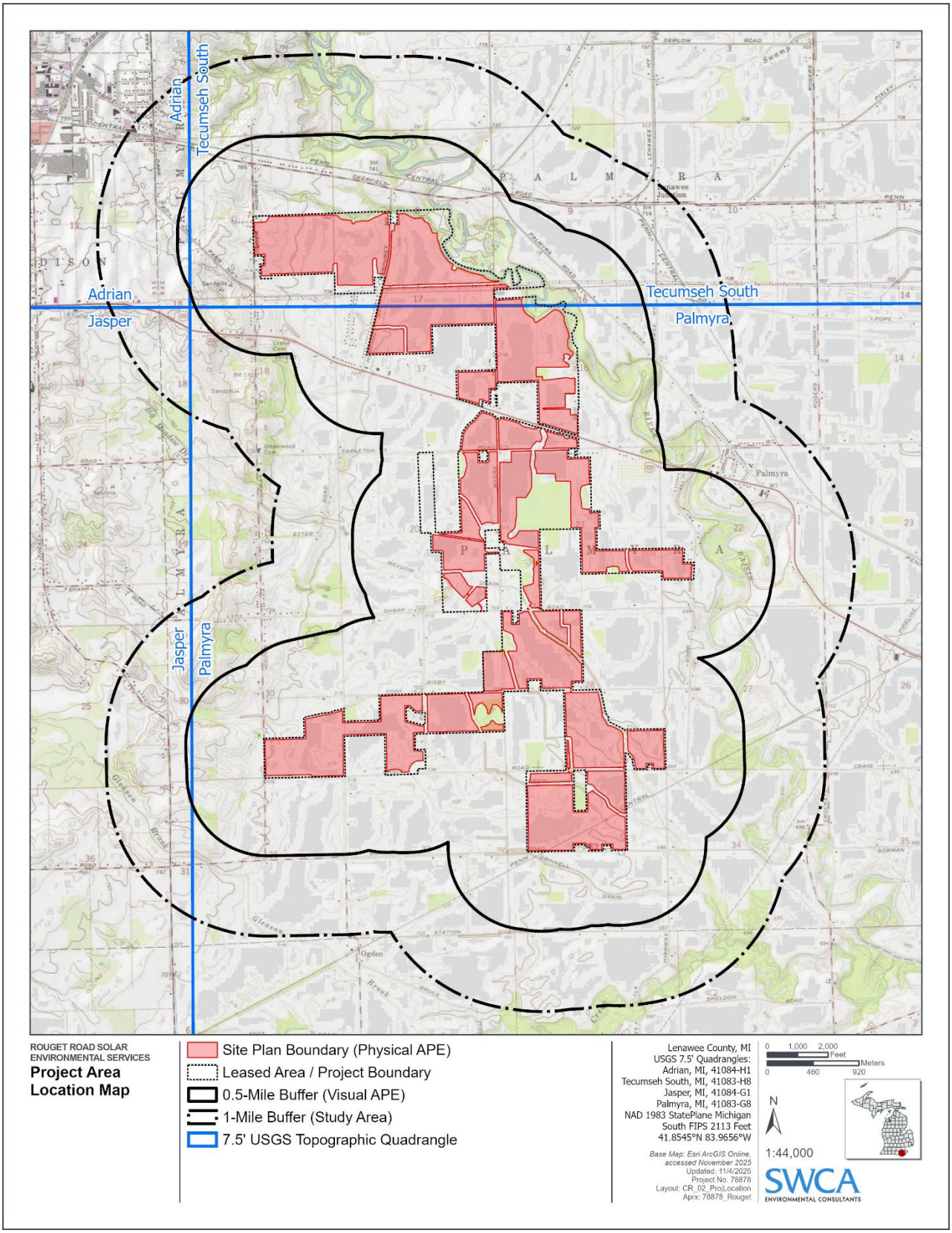

Figure 2. Portions of the USGS 7.5' series Tecumseh South and Palmyra, Michigan Topographic Quadrangles showing the site plan boundary and leased area/Project boundary.

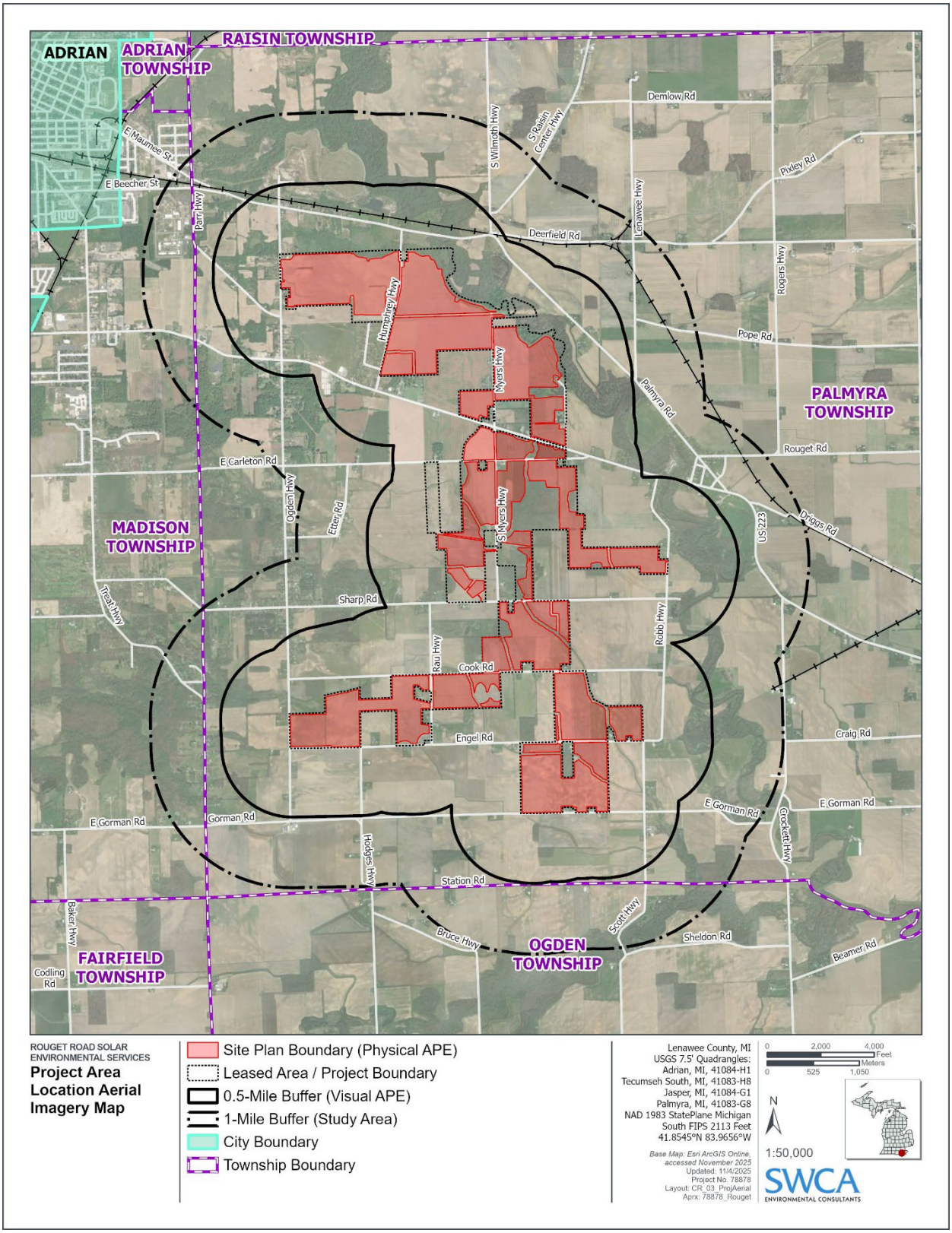

Figure 3. Aerial view showing the site plan boundary and leased area/Project boundary in Palmyra Township, Lenawee County, Michigan.

Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan

JANUARY 2025

PREPARED FOR

Rouget Road, LLC

PREPARED BY

SWCA Environmental Consultants

CULTURAL RESOURCES DESKTOP REVIEW FOR THE ROUGET ROAD, LLC LENAWEE COUNTY, MICHIGAN

Prepared for

Rouget Road, LLC
353 North Clark Street, 30th Floor
Chicago, Illinois 60654
Attn: J Kevin Cole

Prepared by

Rachel Lawrence, M.A., RPA
Heather MacIsaac, B.A.

and

Anna Gilmer, M.A., RPA

SWCA Environmental Consultants
200 22nd Street, Suite 220
Lombard, Illinois 60148
(630) 705-1762
www.swca.com

SWCA Project No. 78878

SWCA Cultural Resources Report No. 25-27

January 2025

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1 INTRODUCTION

SWCA Environmental Consultants (SWCA) completed a cultural resources desktop review for the proposed Rouget Road, LLC (project), located in Lenawee County, Michigan (Figure A-1 in Appendix A). The Project Area spans approximately 2,490 acres (1,008 hectares) of privately owned land near the towns of Adrian, Palmyra, and Ogden. SWCA completed the desktop review for the Project Area plus a surrounding 1.0-mile (1.6-kilometer) buffer around the Project Area. The surrounding 1.0-mile buffer is henceforth referred to as the Study Area (Figures A-2 and A-3).

The objective of the desktop review was to identify existing cultural resources within the Project Area and Study Area to inform project facility siting. Additionally, the Study Area was evaluated to gain an understanding of the type and density of cultural resources in the vicinity of the Project Area. This report summarizes the methods SWCA used to complete the desktop review and presents the results of the background research. It does not serve as Section 106 clearance for the proposed project.

2 REGULATORY FRAMEWORK

Projects in Michigan can come under the purview of two primary cultural resources regulations, the National Historic Preservation Act (NHPA) and Michigan's Natural Resources and Environmental Protection Act. Both are administered by the Michigan State Historic Preservation Office (MI SHPO).

If the project is deemed a federal undertaking (requiring a federal permit, license, or approval; being located on federally owned or managed land; or receiving federal financial assistance), a cultural resources survey most likely would be mandated to ensure compliance with Section 106 of the NHPA. The scope of required cultural resources surveys would then be determined by the functioning federal lead agency in cooperation with the MI SHPO and, if applicable, the pertinent Tribal Historic Preservation Offices as defined in both Section 101 of the National Environmental Policy Act and Section 106 of the NHPA.

Under Michigan law, the state oversees all archaeology performed on state land. The Natural Resources and Environmental Protection Act (Public Act 451 of 1994, Part 761) requires that a permit be obtained prior to undertaking any archaeological investigation on state land.

Public Act 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 megawatts or more, to wind projects with a capacity of 100 megawatts or more, and to energy storage facilities with a capacity of 50 megawatts or more. Public Act 233allows developers the option of applying to the Michigan Public Service Commission (MPSC) to construct utility-scale renewable energy facilities if the local unit of government does not have a compatible renewable energy ordinance. If a compatible renewable energy ordinance is in place, the developer must apply with the local unit of government first, but if the project is denied, the developer may submit to the MPSC for approval. Projects that fall into these categories must identify and provide information on the effects of the project on environmental, natural, and cultural resources.

The project will occur solely on privately held land; thus, no state or local laws requiring archaeological investigations or surveys are anticipated to apply for this project. However, Public Act 233 requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC.

3 METHODOLOGY

SWCA initially submitted a request for in-person research to the MI SHPO on April 7, 2023. Staff at the MI SHPO approved the request and scheduled a research appointment for April 20, 2023. An SWCA archaeologist obtained information in person on previous cultural resources surveys, previously recorded archaeological resources, and previously recorded postcontact architectural resources within the Study Area.

As the Project Area and Study Area were revised in fall 2024, SWCA submitted a second request to the MI SHPO for archaeology and survey site files within the revised Study Area. MI SHPO provided all available records on December 9, 2024. Due to the ongoing updates to the MI SHPO's database, a process that was initiated on February 24, 2024, only archaeology files are currently available. Postcontact architecture files and both postcontact architectural and archaeological survey reports are not currently available as the MI SHPO are scanning these files for upload into a new database. As such, SWCA relied on the April 2023 postcontact architectural resource files and survey reports for this review. SWCA additionally reviewed the National Register of Historic Places (NRHP) database for Michigan as the best available recent data regarding architectural resources.

In addition to the site file search, SWCA investigated historic plat and topographic maps and historic aerial imagery of the Project Area and Study Area. SWCA also researched environmental factors such as modern and historic land use and soil units mapped by the Natural Resources Conservation Service (NRCS) to determine the likelihood of the project to encounter previously unrecorded precontact or postcontact archaeological resources.

4 RESULTS

4.1 Physiography, Geology, and Soils

The Project Area is situated within the Erie-Huron Lake Plain of the Eastern Lake section of the Central Lowland province of the Interior Plains (NRCS 2022:343). The Erie-Huron Lake Plain is a fairly level glacial lake plain with scattered sandy ridges formed by former shorelines and moraines. Elevation ranges from approximately 570 to 815 feet (175 to 250 meters [m]), whereas local relief averages 10 feet (3 m). Major confluences in the Erie-Huron Lake Plain include the Clinton, Huron, and Saginaw Rivers, which empty into the Great Lakes. The Project Area is located within the Floodwood Creek-River Raisin watershed and the Big Meadow Drain-Black Creek watershed, which empty into the River Raisin (U.S. Environmental Protection Agency 2023). Mississippian- to Silurian-age limestone, shale, and dolomite are common along the surface and along the shores of Lake Erie and Lake Huron. Broad, level, and somewhat poorly drained lake plains feature American beech, sugar maple, silver maple, green ash, pin oak, swamp white oak, and American elm, whereas sandy areas feature eastern white pine, eastern hemlock, and other coniferous trees (NRCS 2022:344).

This ecoregion is also part of the Maumee Lake Plain and the Ann Arbor Moraines sub-subsections. The Maumee Lake Plain is a broad, flat, glaciated clay lake plain with rich, loamy soils deeply mantled by till and outwash and dissected by broad glacial drainageways containing sandy soils (Albert 1995). This region formerly included beech-sugar maple forest, elm-ash forest, deciduous swamps, white oak-black oak savannas, wet prairies, and coastal marshes, but now has been largely cultivated (Albert 1995; NRCS 2022). The Ann Arbor Moraines sub-subsection is a long, narrow band of fine- and medium-textured end and ground moraine bordered by flat lake plain on the east and by sandy outwash, end moraine, and ice-contact features to the west. This region formerly supported oak and oak-hickory forests, with oak

savannas along the western edge (Albert 1995). Major wildlife species in the Erie-Huron Lake Plain area include white-tailed deer; cottontail rabbits; squirrels; raccoons; pheasants; bobwhite quail; songbirds; various species of snakes, frogs, and turtles; sunfish; perch; bass; walleye; catfish; carp, sucker; and northern pike.

There are 40 soil series mapped within the Project Area by the NRCS (Table 1). The soils range from very poorly drained to excessively drained loams to sandy loams. The most common soils for the Project Area include Brady and Macomb loams, 0 to 3 percent slopes; Colwood very fine sandy loam, 0 to 3 percent slopes; Wauseon loam, 0 to 3 percent slopes; Ziegenfuss clay loam, 0 to 1 percent slopes; Brady and Macomb sandy loams, 0 to 3 percent slopes; and Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes. These soil types, and their implication for site formation processes and archaeological potential, are discussed further in Section 4.6.

Table 1. Soils within the Project Area

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
BbA	Berrien loamy sand, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BbB	Berrien loamy sand, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcA	Berrien sandy loam, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcB	Berrien sandy loam, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BhA	Brady sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on strand plains	Loamy over sandy and gravelly glaciofluvial deposits
BkA	Brady and Macomb loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BnA	Bronson sandy loam, 0 to 3 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BnB	Bronson sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BoA	Brookston loam, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
CbB	Cadmus sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over loamy till
CeA	Colwood very fine sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CgA	Conover loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Loamy till
GbA	Genesee sandy loam, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
GcA	Genesee and Eel loams, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GgA	Griffin and Sloan loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Clayey till
KbC	Kendallville sandy loam, 7 to 15 percent slopes	Well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over till
KeA	Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on deltas	Stratified loamy glaciofluvial deposits
LcA	Linwood muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Wood organic material over loamy till
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Drainageways on till-floored lake plains	Sandy and/or loamy glaciofluvial deposits over loamy till
NaA	Nappanee silt loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Clayey till
NbB	Nappanee loam, 3 to 7 percent slopes	Somewhat poorly drained	Knolls on ground moraines	Clayey till
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	Somewhat poorly drained	Knolls on ground moraines	Clayey till
OcC	Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded	Excessively drained	Beaches on till-floored lake plains	Glaciofluvial deposits and/or sandy glaciolacustrine deposits over loamy till
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	Poorly drained	Depressions on till plains	Loamy till
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PdB	Plainfield and Berrien loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PeB	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PwmaaA	Pewamo clay loam, dense substratum, 0 to 1 percent slopes	Poorly drained	Drainageways on nearshore zones (relict), flats on nearshore zones (relict)	Clayey till over dense till
RbA	Rollin muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Herbaceous organic material over marl
SbA	Sebewa sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on glacial drainage channels	Loamy over sandy and gravelly glaciofluvial deposits
Sf	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	Poorly drained	Drainageways on stream terraces, drainageways	Loamy drift over sandy and gravelly outwash
WcA	Wauseon loam, 0 to 3 percent slopes	Poorly drained	Depressions on till-floored lake plains	Glaciolacustrine deposits over clayey till

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	Poorly drained	Wave-worked till plains	Clayey till over loamy till
W	Water	N/A	N/A	N/A

Source: NRCS (2024).

4.2 Historical Land Use

SWCA reviewed historic plat and topographic maps, as these sources provide information on past land use within the Project Area and Study Area that may indicate the probability of encountering significant precontact and postcontact cultural resources in or near the Project Area. The historic maps indicate that there has been a general consistency in the road network and land-use patterns from the late nineteenth century into the modern era in the Study Area.

The earliest available map of the Project Area is an 1819 General Land Office survey map (Bureau of Land Management General Land Office 2024). The Project Area is uninhabited. The River Raisin is drawn as a winding water course east of the Project Area. There are patches of marshlands, and tributaries are marked but not fully drawn. No structures are depicted. Palmyra and Lenawee Junction have not yet been established.

The first available plat map, dated 1874, shows that the Project Area and Study Area had been divided into large landholdings. Residences, schools, and churches are depicted. Roads and three railroads also are in place, including the Lenawee County Railroad and Palmyra Road. The current U.S. Highway 233 is shown as a railroad. Several structures are depicted on landholdings within the Project Area. Some of these structures are adjacent to orchards or small agricultural fields. There are branches of unnamed tributaries flowing throughout the Project Area, one of which is the modern Big Meadow Drain (Everts and Stewart 1874).

By 1893, the Project Area is depicted similarly to the 1874 plat. More landowners have appeared, represented by smaller landholdings, and structures are depicted within the Project Area. The unnamed tributaries are still depicted, running through the central and southern portions of the Project Area (Cadwell 1893).

The 1916 plat map shows an increase in landowners once more as the communities of Lenawee Junction and Palmyra continue to grow. Structures also are depicted on these parcels in the Project Area and are shown mostly along roads. U.S. Highway 233 is depicted as the Toledo Western electric railroad. There is another railroad that runs north-south to the Toledo Western electric railroad, connecting from Adrian to Palmyra within the Project Area. This segment of rail had been a road on the 1874 and 1893 plat maps. Several tributaries also are shown within the Project Area (Ogle 1916).

The 1921 plat map does not show individual structures beyond churches and schools, neither of which are in the Project Area. Landowner names are given, and the road network and railroads appear in the same location as on previous plats (*Adrian Daily Telegram* 1921). The 1928 plat presents the same information (*Adrian Daily Telegram* 1928).

SWCA also reviewed historic topographic maps to determine the land use of the Project Area and Study Area. Four historic topographic maps from 1939 to 1972 show that there has been little development from the early twentieth century to the present (U.S. Geological Survey [USGS] 2024). On the earliest available topographic map (Blissfield, Michigan, 1939, 1958 edition), multiple structures are shown in the

Project Area along roadways. The tributaries shown on the plat maps are named and shown: Big Meadow Drain, Bixby Drain, and Grinnell Drain. The road network and railroads are also depicted. The 1941 Blissfield, Michigan, topographic map reveals a similar image. The 1972 Palmyra, Michigan, and 1972 Tecumseh South, Michigan, topographic quadrangles name most of the roads in the Project Area, and they show that residential development had not increased outside of Palmyra and Adrian. Transmission and telecommunication cables are also depicted (USGS 2024).

A review of 17 aerial photographs taken between 1955 and 2022 indicates that minimal land development occurred within the Project Area and its environs. On the aerial images beginning in 1955, the landscape is agricultural. Isolated farmsteads are visible along roadways outside of Palmyra, Lenawee Junction, and Adrian. Drainages are visible either as scars on the landscape or are lined with trees, as is the River Raisin. There are some stands of trees throughout the Project Area. Between 1955 and 2022, no noticeable changes occur to the land use in the Project Area or Study Area (Historic Aerials 2024).

4.3 Previous Cultural Resources Surveys

A review of MI SHPO records identified one cultural resources survey that was conducted in the Project Area and two cultural resources surveys conducted within the Study Area (Table 2). Project ER00-7.17.161134 was a reconnaissance investigation conducted in 2017 by Archaeological Consultants of Ossian. The survey area covered 0.44 acre of land, and no cultural resources were identified during the survey (Stillwell 2017). Project ER17-391 was conducted for the Howard Street/West Michigan CMAQ and Rehabilitation project; however, the MI SHPO records did not contain information on the surveyors, year, or report title. Project B17-258, identified on quad maps in the MI SHPO research repository as Lauterbur 2016, was a Phase I archaeological survey conducted in support of the replacement of the River Raisin Bridge in Palmyra, Michigan. The MI SHPO records did not include information on the extent of the survey; however, no archaeological sites were identified during the survey.

Table 2. Previous Cultural Resources Surveys in the Study Area

Project ID	Project Name	Survey Year	Surveyors	Report Title	Location
ER00-7.17.161134	G2 Cellular Tower Site Review #161134	2017	Archaeological Consultants of Ossian	*An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project #161134) in Palmyra, Lenawee Conty, Michigan. 17FR29Mi.*	Project Area
ER17-391	Howard Street/ West Michigan CMAQ and Rehabilitation	None recorded	None recorded	None recorded	Study Area
B17-258	Lauterbur 2016	2016	Michigan Department of Transportation	*Archaeological Investigations at US-223 River Raisin Bridge Replacement, Palmyra, Lenawee County.*	Study Area

4.4 Previously Recorded Archaeological Sites

[redacted]

[redacted]

4.5 Previously Recorded Architectural Resources and Cemeteries

SWCA reviewed the National Park Service's NRHP database for Lenawee County, Michigan, regarding information on historic districts, buildings, archaeological sites, and other properties eligible for or listed in the NRHP. The NRHP database did not identify any NRHP-listed resources within the Project Area (National Park Service 2024).

SWCA also reviewed historic architecture data provided by the MI SHPO in April 2023. No previously recorded architectural resources are located within the Project Area; three architectural resources are located in the Study Area (Table 4; Appendix A: Figure 5).

No recorded cemeteries are present in the Project Area; two postcontact cemeteries (Palmyra Village Cemetery and Crane Cemetery) are located within the Study Area (Table 5; Appendix A: Figure 5). Palmyra Village Cemetery was included in the MI SHPO site file data, while Crane Cemetery was identified through archival research of historic topographic maps. Due to the data gap in the MI SHPO site file records since February 2024, it is not clear if Crane Cemetery is still absent from MI SHPO site file records.

Table 4. Previously Recorded Historic Architectural Resources in the Study Area

Site ID	Historic Name	City	NRHP Status	Location
P23943	Palmyra Presbyterian Church	Palmyra	Unevaluated	Study Area
P61449	Bruce Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area
P61451	Scott Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area

Table 5. Previously Recorded Cemeteries in the Study Area

Historic Name	Record Source	Location
Palmyra Village Cemetery	MI SHPO site file data	Study Area
Crane Cemetery	Archival research	Study Area

4.6 Geoarchaeology

Geoarchaeology, which is a multidisciplinary field that incorporates topography, geomorphology, geology, and soils, helps archaeologists to understand how geological processes have influenced the preservation of archaeological sites. Research conducted by Monaghan and Lovis (2005) demonstrates that deeply buried soils have an increased probability of sustaining cultural resources where fluvial deposits overlie alluvial deposits as a result of waterways breaching their banks. Monaghan and Lovis developed a predictive geoarchaeological model that takes these effects into account and classifies an area's likelihood of having cultural resources from Low to High-Very High.

Based on the Monaghan and Lovis (2005) model, the Project Area intersects with areas modeled as having moderate to high potential for deeply buried archaeological deposits (Figure A-6). [redacted] Otherwise, the remainder of the Project Area is largely mapped as exhibiting a low potential for deeply buried archaeological deposits.

[redacted]

4.7 Cultural Resources Context and Potential

The potential of the Project Area to contain cultural resources was developed through examination of the natural and topographical characteristics of the Project Area and available historic-era maps and aerial photographs.

4.7.1 Potential for Precontact Archaeological Sites

[redacted]

4.7.2 Potential for Postcontact Archaeological Sites

[redacted]

5 SUMMARY AND RECOMMENDATIONS

In summary, the records review established that one cultural resources survey has been conducted previously within the Project Area, and two cultural resources surveys have been conducted in the Study Area. These compliance surveys were negative and did not result in the recordation of cultural resources within the Project Area or the Study Area. However, [redacted] None of the archaeological sites within the Project Area have been evaluated for listing in the NRHP. There are no previously recorded architectural resources within the Project Area and three architectural resources in the Study Area. Based on MI SHPO records and a review of the NRHP, there are no NRHP-listed resources located within the Project Area or Study Area.

There is an overall moderate probability for significant precontact archaeological sites and a low to moderate probability for significant postcontact archaeological sites within the Project Area. [redacted]

Should the project require archaeological survey, the geoarchaeological modeling (Monaghan and Lovis 2005) suggests that shovel testing and/or deep testing (e.g., auguring) may be necessary [redacted] Pedestrian survey is a viable survey methodology as long as alluvial soils are confined to the plow zone (e.g., 12 inches [30 centimeters]); the limits of shovel testing is typically 3 feet (1 m).

Based on the MPSC regulations and our communications with the MI SHPO (personal communication, Sarah Surface-Evans and Scott Slagor, January 30, 2025), SWCA recommends initiating consultation with the MI SHPO. SWCA understands that MI SHPO has initiated a new consultation process for projects subject to permitting through the MPSC, and that the MI SHPO will provide expert testimony regarding cultural resources to the MPSC. To initiate the consultation process, the MI SHPO requests developers to complete a consultation application, in coordination with a professional archaeologist and architectural historian, The MI SHPO will provide their recommendations for next steps, including survey and avoidance requirements. SWCA understands that RWE will have 1 year after submittal of the MPSC permit application to obtain the approval of survey reports or recommendations submitted to the SHPO.

In keeping with Public Act 233, which requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC, SWCA recommends this document be provided to the MPSC for review. Approval from the MPSC is required before development within the boundaries of these sites occurs.

6 REFERENCES CITED

Adrian Daily Telegram. 1921. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21190/Palmyra+Township/Lenawee+County+1921/Michigan/. Accessed November 14, 2024.

———. 1928. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/1610467/Palmyra+Township++Raisin+River/. Accessed November 14, 2024.

Albert, Dennis A. 1995. Regional landscape ecosystems of Michigan, Minnesota and Wisconsin: A working map and classification. General Technical Report NC-178. U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota. Available at: https://www.nrs.fs.usda.gov/pubs/gtr/other/gtr-nc178/index.html. Accessed November 1, 2024.

Bureau of Land Management General Land Office. 2024. Original Survey Plat, Township 7 North, Range 4 East, 3rd Principal Meridian. Available at: https://glorecords.blm.gov/details/survey/default.aspx?dm_id=27676&sid=usa5y3jo.a4o#surveyDetailsTabIndex=0. Accessed November 14, 2024.

Cadwell, George D. 1893. Atlas of Lenawee County, Michigan. Geo. D. Cadwell and Company, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21077/Palmyra+Township/Lenawee+County+1893/Michigan/. Accessed November 14, 2024.

Everts and Stewart. 1874. Combination Atlas Map of Lenawee County, Michigan. Everts and Stewart, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/20906/Palmyra+Township/. Accessed November 14, 2024.

Historic Aerials. 2024. Historic Aerials Viewer. Available at: https://www.historicaerials.com/viewer. Accessed November 14, 2024.

Monaghan, G. William, and William A. Lovis. 2005. *Modeling Archaeological Site Burial in Southern Michigan: A Geoarchaeological Synthesis*. Michigan State University Press, East Lansing.

National Park Service. 2024. National Register of Historic Places Database and Research. Available at: https://www.nps.gov/subjects/nationalregister/database-research.htm. Accessed January 13, 2025.

Natural Resources Conservation Service (NRCS). 2022. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. Washington, D.C.

———. 2024. Custom Soil Report. Available at: http://websoilsurvey.nrcs.usda.gov. Accessed December 12, 2024.

Ogle, George A. 1916. Standards Atlas of Lenawee County, Michigan. Geo. A. Ogle Publishers and Engravers, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/22243/Palmyra+Township/Lenawee+County+1916/Michigan/. Accessed November 14, 2024.

Stillwell, Larry N. 2017. *An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project No. 161134) in Palmyra, Lenawee County, Michigan*. Archaeological Consultants of Ossian. On file at the Michigan State Historic Preservation Office, Lansing, Michigan.

U.S. Environmental Protection Agency. 2023. How's My Waterway Viewer. Available at: https://mywaterway.epa.gov/. Accessed November 14, 2024.

U.S. Geological Survey (USGS). 2024. National Geologic Map Database Project TopoView. Available at: https://ngmdb.usgs.gov/topoview/viewer/#14/41.8731/-83.9695. Accessed November 14, 2024.

APPENDIX A

Figures

Figure A-1. Location of the proposed Rouget Road, LLC Area in Michigan.

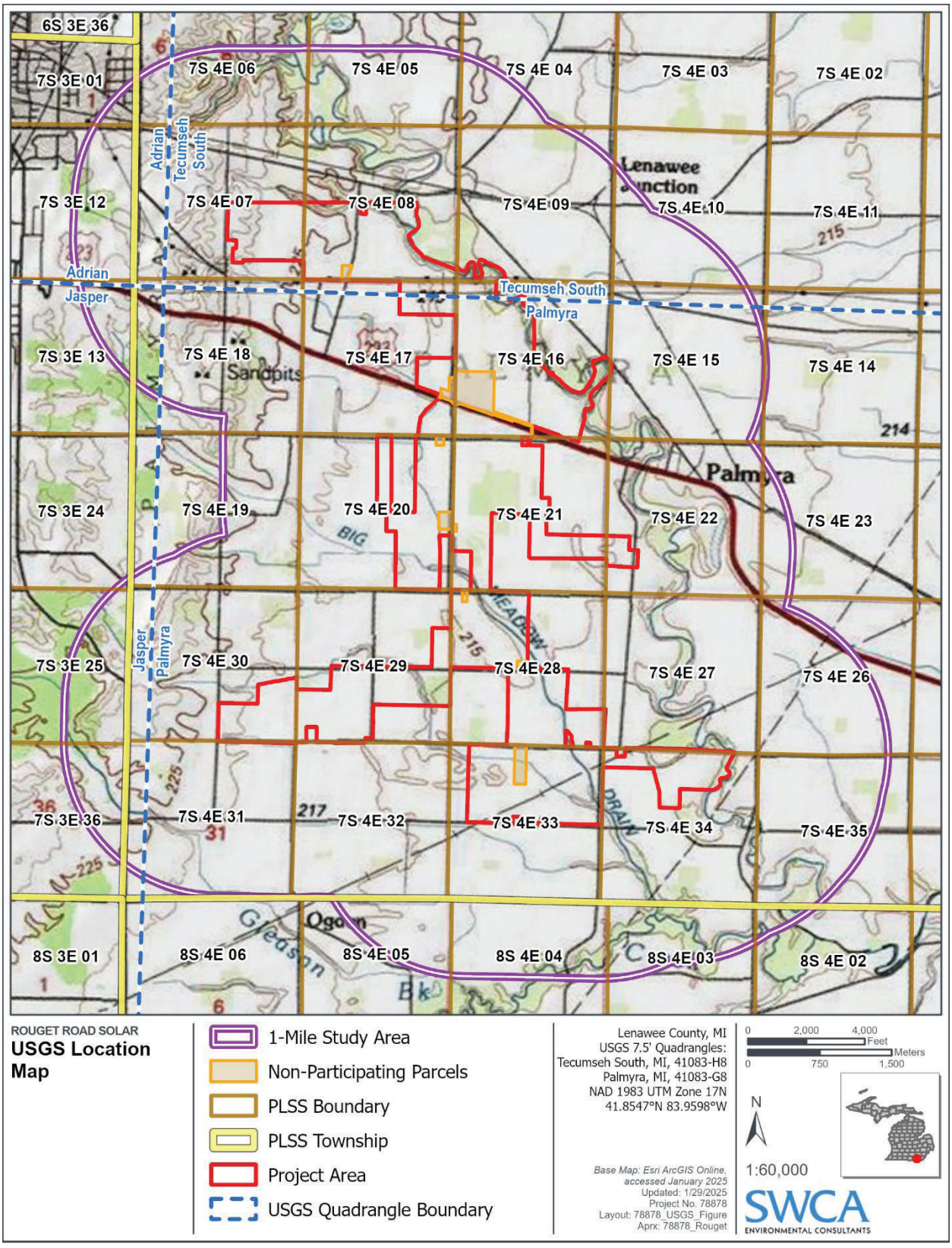

Figure A-2. Location of the Study Area for the proposed Rouget Road, LLC on a USGS topographic map.

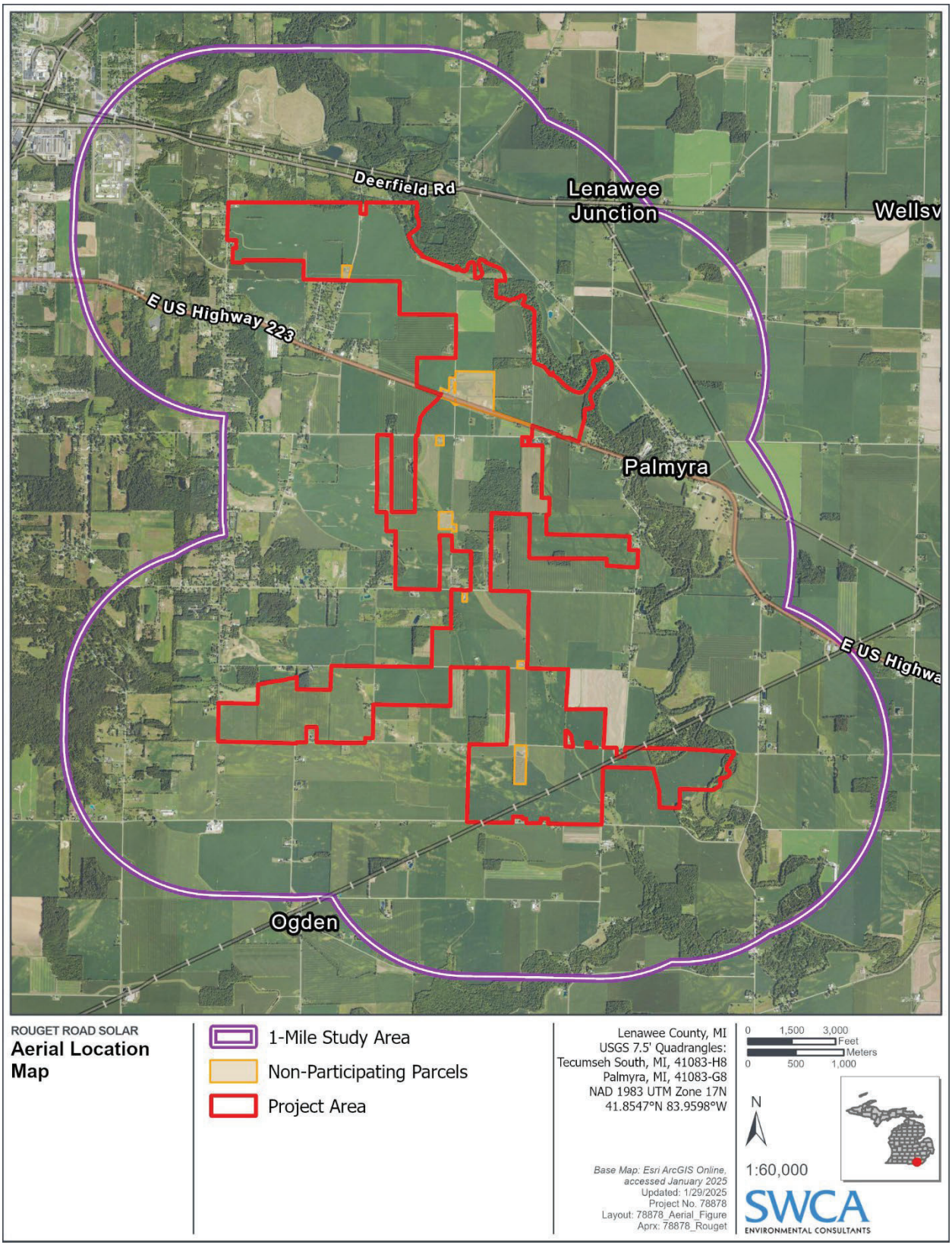

Figure A-3. Overview of the Study Area for the proposed Rouget Road, LLC on aerial imagery.

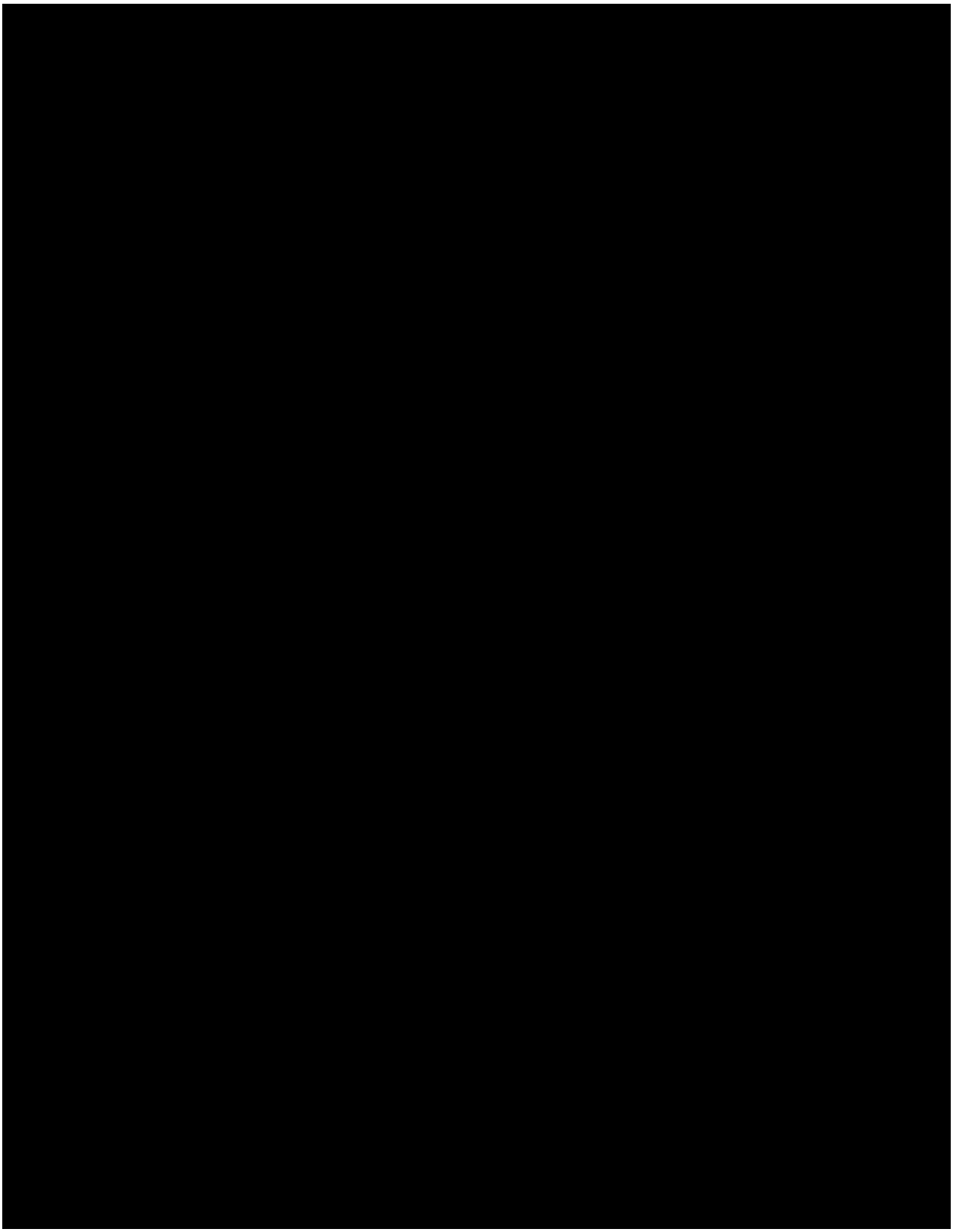

Figure A-4. Results of the background research for previously recorded cultural resources and previously conducted surveys.

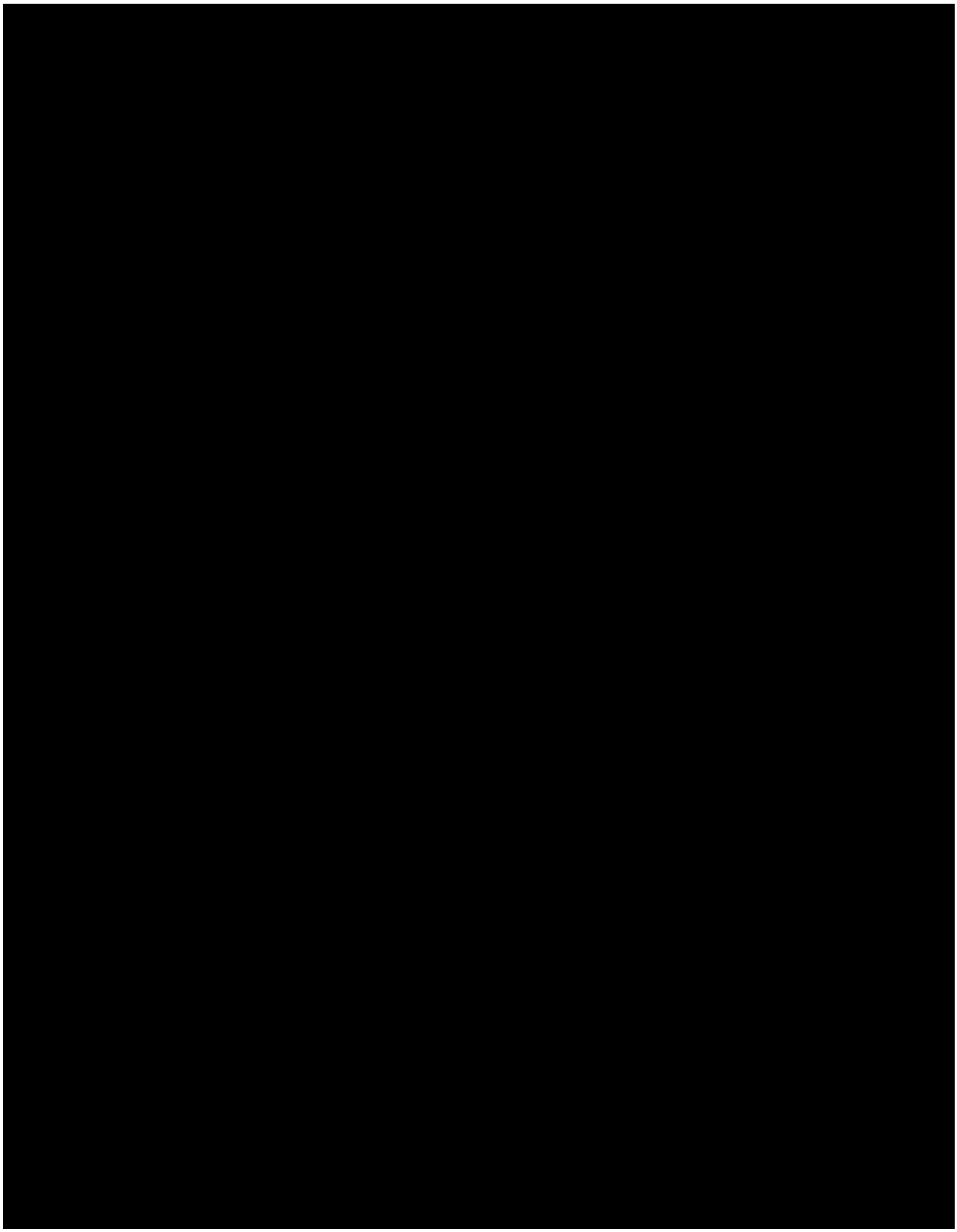

Figure A-5. Results of the background research for postcontact architectural resources and cemeteries.

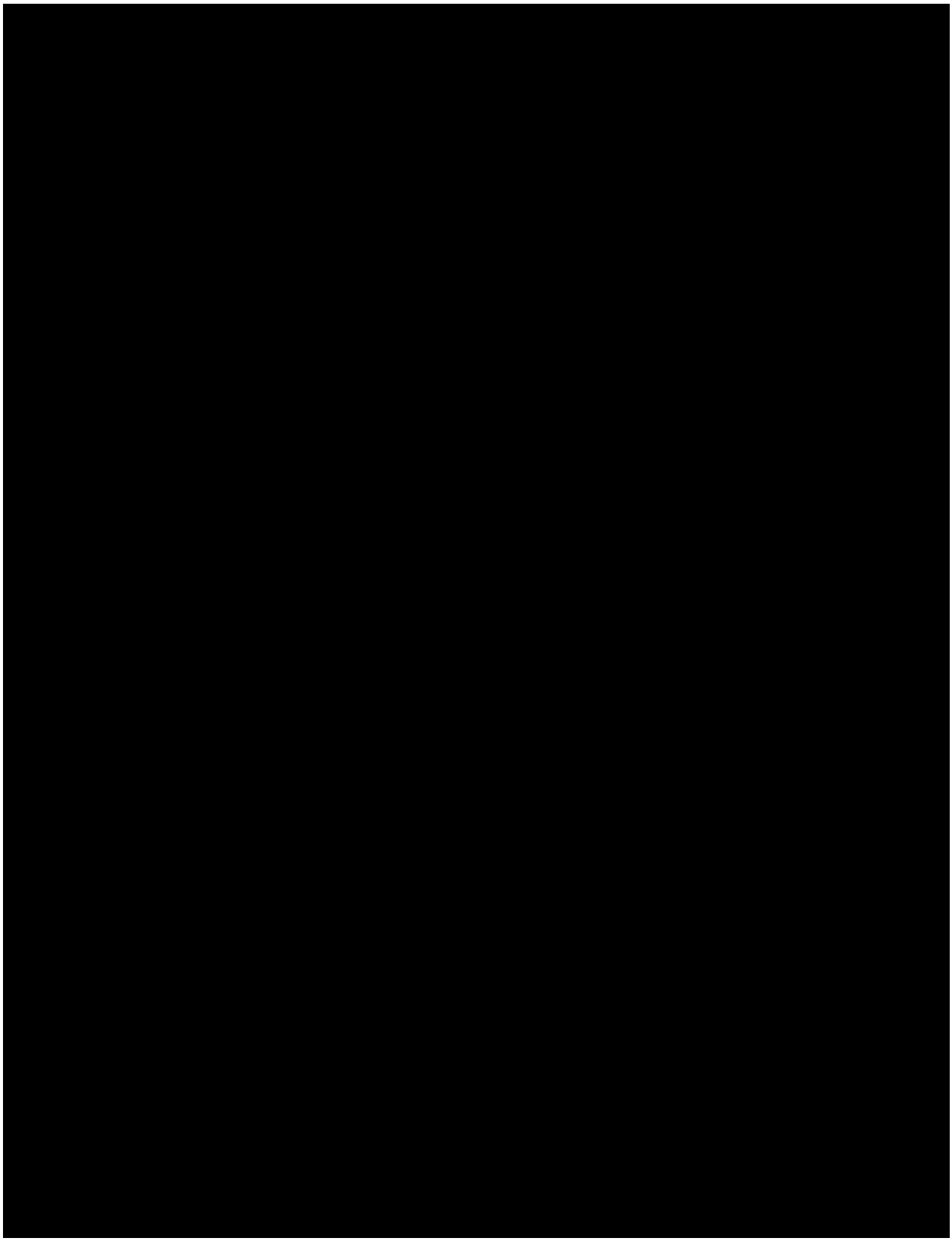

Figure A-6. Areas modeled as having moderate to high potential for deeply buried archaeological deposits in the Project Area and Study Area.

GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
MICHIGAN STRATEGIC FUND
STATE HISTORIC PRESERVATION OFFICE

QUENTIN L. MESSER, JR.
PRESIDENT

September 10, 2025

KEVIN COLE
ROUGET ROAD LLC
10250 PENLAWN DR.
JEROME, MI 49249

RE: SR25-23 PA233 Review Rouget Road, LLC Solar, T07S/R04E/Sec. 7, 8, 9, 15, 16, 17, 20 ,21, 22, 27, 28, 29, 30, 33, and 34, Palmyra Township, Lenawee County (MPSC)

Dear Mr. Cole:

We have received your request for review of the above-cited project under Public Act 233 of 2023 for Renewable Energy and Energy Storage Facility Siting (PA 233) at the above-noted location. We have reviewed the assessment prepared by SWCA, "Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan" and appreciate the information provided. To fully consider and address impacts to cultural and historic sites we require additional information, please send the following:

General

In the materials submitted, the project area boundaries in the submission form and in the Desktop Review do not match. Please ensure that we have the final project boundary maps included in all materials submitted to our office. Desktop Review states that the project plan will avoid archaeological sites, however, the project mapping provided does not make this apparent or clear. We cannot assess the impact of the proposed project on historic resources without accurate mapping information. Additionally, we would like to see the locations of staging areas, vehicle traffic, and any other areas that may have ground disturbance mapped.

Archaeological Resources

Due to the presence of previously documented sites within and near the project area, and the high archaeological sensitivity for the River Raisin valley generally, SHPO requests full archaeological survey for the entire project area, including staging areas. In particular, the boundaries of site 20LE28 are poorly delineated. In order to avoid this site, which is known to contain burials, additional survey methodologies may be necessary beyond pedestrian survey or shovel testing***. SHPO recommends consulting with our office and Tribal Nations with historic connections to this region to develop an appropriate methodology***, which may include geophysical prospection or historic human remains detection dog (HRD) survey. SHPO also recommends developing an Unanticipated Discovery Plan (UDP) for the project. A UDP specifies who will be contacted and what measures will be taken in the event of an unanticipated discovery of archaeological materials or human remains during the project implementation. Please see the UDP template attached, for an example of how these documents are organized. SHPO encourages the project proponent to work with consulting party tribes to develop an

appropriate UDP and protocol for handling human remains.

Above-ground Resources

SHPO concurs with the proposed methodology of utilizing the Above Ground Table in lieu of identification forms except that we require identification forms for properties that are identified as eligible. The table does not provide enough information for eligible properties. For eligible properties, photographs of all resources must also be included in an attachment with Architectural Properties Identification Form. When discussing effects to above-ground resources, please be sure to provide discussion of visual impacts as well as visual barriers in place that may play in to effects determinations. Also be sure that the Historic Resource Survey Report contains enough history and contextual information about the area and resources for SHPO to adequately assess eligibility.

Additional information must be submitted online through our Additional Information Portal.

Please note that our review cannot proceed until we are able to consider the information requested above. This letter is not concurrence. If you have any questions, please contact please contact Senior Archaeologist, Sarah Surface-Evans, surfaceevanss1@michigan.gov, (517) 282-7959 or Historian, Katlyn Burns Yancho, at 517-256-3416, burnsyanchok@michigan.gov. **Please reference our project number in all communication with this office regarding this review.** Thank you for your consultation.

Sincerely,

Sarah Surface-Evans, PhD, RPA
Senior Archaeologist

SES:KAK:KBY:SSE

Enclosure(s): UDP Template

Copy: Anna Gilmer, SWCA

Little River Band of Ottawa Indians

From:	Jonathan Libbon
To:	"coreyawells@lrboi-nsn.gov"
Cc:	Carol Mcknight; Aleyda Galan; Cole, J Kevin; Quarles, Mark; Anna Gilmer
Subject:	Rouget Road Solar Consultation Letter
Date:	Thursday, November 20, 2025 5:01:00 PM
Attachments:	Rouget Tribal Consulation LTR_20Nov2025.pdf image001.png
Sensitivity:	Private

Good Afternoon Corey,

On behalf of Rouget Road Solar Farm LLC, a wholly-owned subsidiary of RWE Clean Energy LLC (RWE), we are reaching out to request your input on the Rouget Road Solar Farm Project, a proposed solar facility in Lenawee County, Michigan. The facility will require a state siting certificate from the Michigan Public Service Commission (MPSC). The attached letter and documentation outline the project and provide details on the cultural resource work completed to date. We are seeking comments from your area of expertise regarding any potential environmental or cultural effects associated with this project.

Please let me or Kevin Cole (cc'd), the project manager from RWE, know if you have any questions about the project.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

The contents of this email and any associated emails, information, and attachments are CONFIDENTIAL. Use or disclosure without sender's authorization is prohibited. If you are not an authorized recipient, please notify the sender and then immediately delete the email and any attachments.

11/20/2025

Dear Tribal Historic Preservation Officer and/or Tribal Cultural Representative,

As part of its responsibilities under Michigan Public Act 233 of 2023 (PA 233), *Renewable Energy and Energy Storage Facility Siting*, the Michigan Public Service Commission (MPSC) is seeking consultation (as required in PA 233 Section 224.1b[1]) and determining the area of potential effects ("APE") for the proposed project. Federally listed sovereign Nations with an interest in the state of Michigan are invited to review and comment on Rouget Road Solar Farm, LLC's (Rouget Road Solar Farm) (a wholly-owned subsidiary of RWE Clean Energy LLC [RWE]) proposed **Rouget Road Solar Farm Project** (the "Project"). The proposed Project will require a state-siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC (PA 233 Section 226.7b). Although Rouget Road Solar Farm requests a review and comment on the Project, the MPSC is the state agency and may be communicated with directly.

Based on Michigan State Historic Preservation Office (MI SHPO) guidance from their *Instructions for the Application for PA 233 Renewable Energy Storage Facility Siting Consultation Form*:

> "**Public Act 233** requires the applicant for energy siting and storage facilities to consider and address impacts *to the environment and natural resources, including, but not limited to, sensitive habitats and waterways, wetlands and floodplains, wildlife corridors, parks,* ***historic and cultural sites****, and threatened or endangered species*. The applicant must submit this information to the Michigan Public Service Commission (MPSC) for consideration in permitting the project. In order to facilitate considerations of historic and cultural sites (hereafter Historic Properties), the MPSC has required applicants to consult with the State Historic Preservation Office (SHPO)."

This letter is part of the early coordination phase of the environmental review process, requesting comments associated with this Project. We are requesting comments from your area of expertise regarding any possible environmental or cultural effects associated with this Project. Please provide any additional information you may have regarding potential cultural resources in the Project area so they may be accounted for during the environmental review of this Project. This information can be provided directly to RWE or the MPSC.

Project Description

The proposed Project is southeast of the city of Adrian, in Palmyra Township, Lenawee County, Michigan (Figure 1). Historic Mapping places the proposed Project area in Sections 7, 8, 9, 15, 16, 17, 20, 21, 22, 27, 28, 29, 30, 33, and 34 of Township 7 South, Range 4 East as seen on the enclosed USGS 7.5 series for Tecumseh South and Palmyra, Michigan Topographic Quadrangle map (Figure 2). Rouget Road Solar Farm is proposing to construct a 175-megawatt (MW) alternating current (AC) solar photovoltaic power generating facility. The leased area/Project area boundary includes approximately 2,142 acres (867 hectares) (Figures 2 and 3). Construction will require 1,513 acres (612 ha) of what is currently primarily agricultural land (see site plan boundary in Figure 1). Limited tree removal is planned across 7.96 acres (3.22 ha). Proposed work required for the Project includes construction of a switchyard, substations, access

[1] Sections refer to those found at: https://www.legislature.mi.gov/documents/2023-2024/publicact/htm/2023-PA-0233.htm

roads, fencing, MV electrical cabling, and solar panel structures. Construction may also include an operations and maintenance building.

Project Permitting
The proposed Project will require a siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC.

PA 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 MW or more, to wind projects with a capacity of 100 MW or more, and energy storage facilities with a capacity of 50 MW or more. Projects that fall into these categories must identify and provide information on the effects of the Project on environmental, natural, and cultural resources. Additional PA 233 information is available online at State Project Reviews | MiPlace[2], and a Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the MPSC is available online at Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the Michigan Public Service Commission. [3]

Cultural Resource Investigations
The APE is the area in which the proposed Project may cause alterations in the character or use of historic resources. As the site plan boundary includes all locations that may be impacted by ground disturbing activities related to the project undertaking, it is considered the physical APE (see Figure 1). The visual APE for assessing visual effects to historic-age resources is a 0.5-mile buffer from the boundaries of the Project area (e.g., leased area/project boundary) (see Figure 2). This boundary will be modified based on visual intrusions that may obscure the project.

Rouget Road Solar Farm has contracted SWCA Environmental Consultants (SWCA) to conduct the archaeological and architectural history surveys. Due to the presence of previously--documented archaeology sites in and near the Project area, and the archaeological sensitivity for the River Raisin Valley, SWCA will conduct a full archaeological survey for the physical APE, including staging areas. The boundaries of [redacted], is mapped as lying within the proposed Project area; however, these site boundaries are mapped based off archival records and the extent of the complex is poorly understood. In order to be sensitive toward this [redacted], we are asking for your input on the extent of the complex and the survey methodologies that may be necessary beyond [redacted] An Unanticipated Discoveries Plan (Exhibit A-1.14 in the MPSC permit application) has been prepared.

Summary of Requested Action
We look forward to consulting with your office on this Project and to a continued dialogue. We ask that you provide any comments regarding the Project area following your review of the enclosure. Please use the above Project name and Project description in your reply.

In summary, the MPSC and Rouget Road Solar Farm are requesting Tribal Governments to:

[2] https://www.miplace.org/historic-preservation/programs-and-services/cultural-resource-management-and-planning/state-project-reviews/

[3] https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/consumer/MPSC_Tribal_Involvement_Guide.pdf?rev=399582a67fbe46e883e6f21d1325e785&hash=AA471378E81539AFBBA758AB04FB3D25

1. Review the Project information.
2. Identify cultural or environmental concerns.
3. Provide feedback on archaeological methodologies (especially near site 20LE28).
4. Ensure that any cultural resources are addressed in the MPSC permitting process.

All comments will be documented and considered in Project design and the forthcoming MPSC state siting process. Consultation with SHPO and the THPOs included in the distribution list below will be incorporated into the cultural survey plan, recordation, and design updates as needed. Your timely response will greatly help us incorporate your concerns into the development of the Project. For that purpose, we request that you provide comments by December 20, 2025.

Tribal consulting parties may respond to myself (Kevin Cole) at rougetroadsola@rwe.com with any comments or concerns. Alternatively, you can reach out directly to Gustavo Cordero at the MPSC at corderog@michigan.gov.

Respectfully,

Kevin Cole
RWE Development Manager
rougetroadsola@rwe.com

cc: Gustavo Cordero, Michigan Public Service Commission
Carol McKnight, SWCA Environmental Consultants
Anna Gilmer, SWCA Environmental Consultants

Distribution List:
Forest County Potawatomi Community, Wisconsin
Hannahville Indian Community, Michigan
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
Little Traverse Bay Bands of Odawa Indians, Michigan
Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan
Menominee Indian Tribe of Wisconsin
Miami Tribe of Oklahoma
Pokagon Band of Potawatomi Indians, Michigan and Indiana
Sault Ste. Marie Tribe of Chippewa Indians, Michigan
Seneca-Cayuga Nation

Enclosures:
1. Figures
    a. Figure 1: State location map
    b. Figure 2: Portions of the USGS 7.5' series Tecumseh South and Palmyra Michigan Topographic Quadrangles showing the Project area.
    c. Figure 3: Aerial view of the Project area location in Palmyra Township, Lenawee County, Michigan.
2. Cultural Desktop Report
3. SHPO PA233 Response

Figure 1. Location of the proposed Rouget Road Solar Project Area in Michigan.

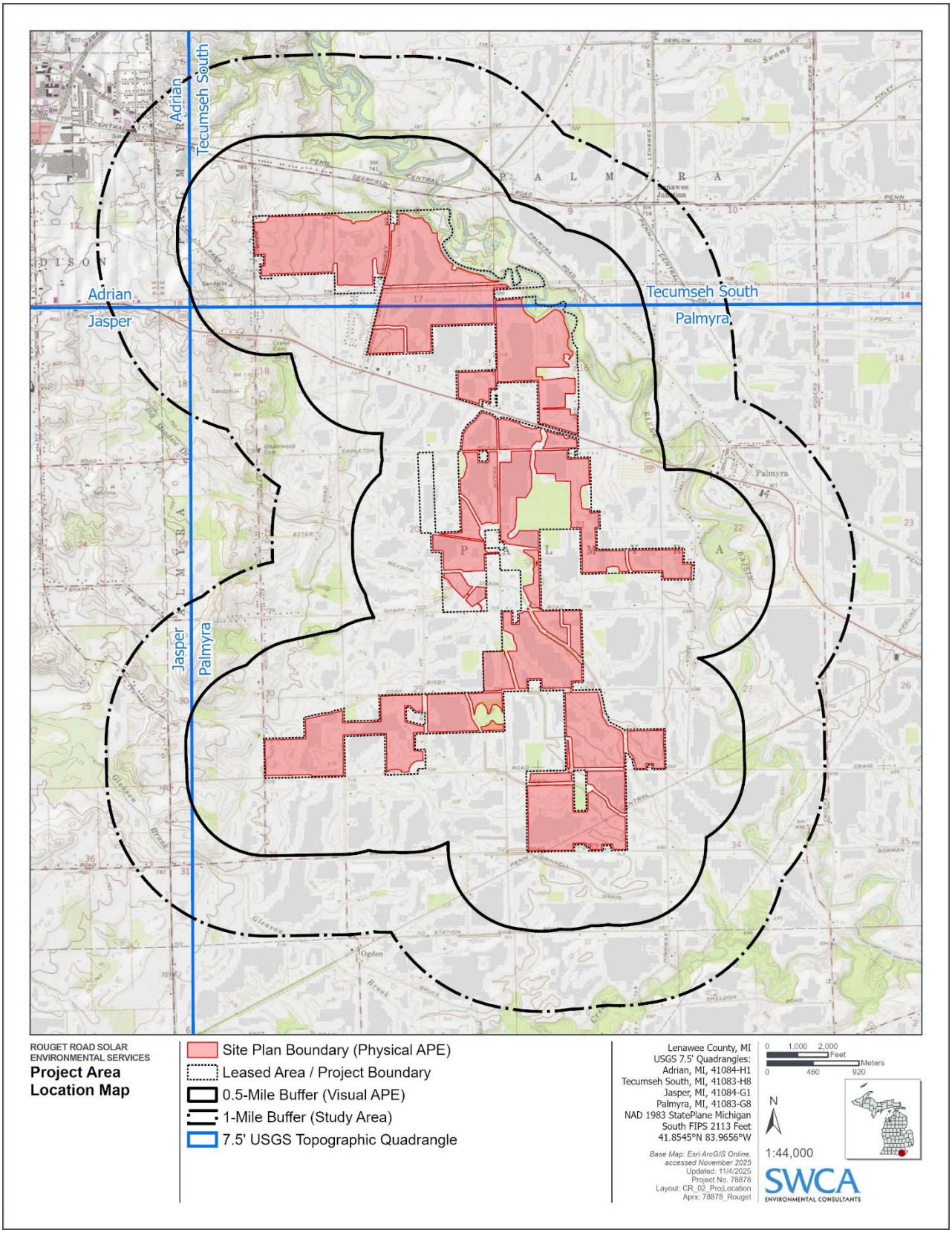

Figure 2. Portions of the USGS 7.5' series Tecumseh South and Palmyra, Michigan Topographic Quadrangles showing the site plan boundary and leased area/Project boundary.

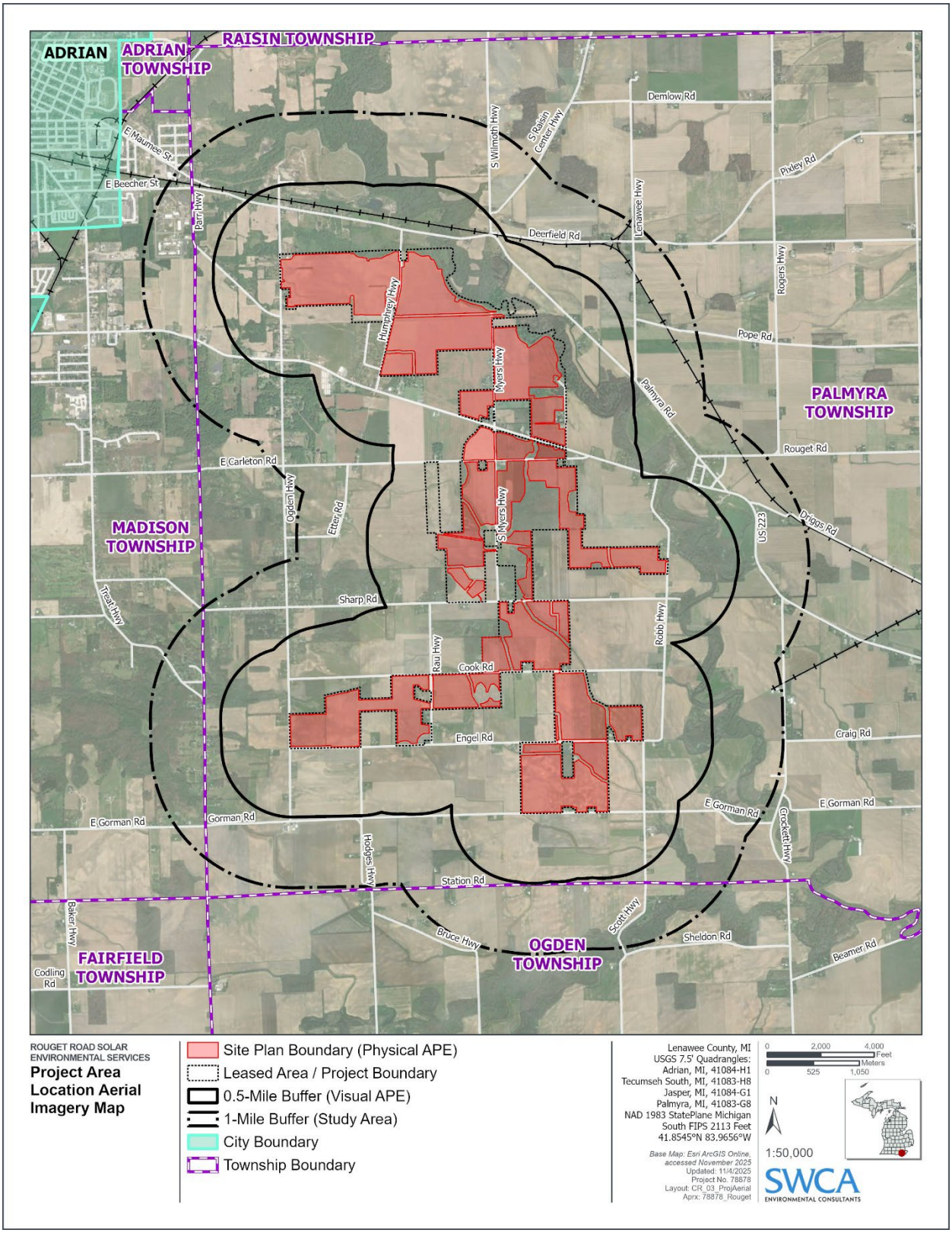

Figure 3. Aerial view showing the site plan boundary and leased area/Project boundary in Palmyra Township, Lenawee County, Michigan.

Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan

JANUARY 2025

PREPARED FOR

Rouget Road, LLC

PREPARED BY

SWCA Environmental Consultants

CULTURAL RESOURCES DESKTOP REVIEW FOR THE ROUGET ROAD, LLC LENAWEE COUNTY, MICHIGAN

Prepared for

Rouget Road, LLC
353 North Clark Street, 30th Floor
Chicago, Illinois 60654
Attn: J Kevin Cole

Prepared by

Rachel Lawrence, M.A., RPA
Heather MacIsaac, B.A.

and

Anna Gilmer, M.A., RPA

SWCA Environmental Consultants
200 22nd Street, Suite 220
Lombard, Illinois 60148
(630) 705-1762
www.swca.com

SWCA Project No. 78878

SWCA Cultural Resources Report No. 25-27

January 2025

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Table 5. Previously Recorded Cemeteries in the Study Area 8

1 INTRODUCTION

SWCA Environmental Consultants (SWCA) completed a cultural resources desktop review for the proposed Rouget Road, LLC (project), located in Lenawee County, Michigan (Figure A-1 in Appendix A). The Project Area spans approximately 2,490 acres (1,008 hectares) of privately owned land near the towns of Adrian, Palmyra, and Ogden. SWCA completed the desktop review for the Project Area plus a surrounding 1.0-mile (1.6-kilometer) buffer around the Project Area. The surrounding 1.0-mile buffer is henceforth referred to as the Study Area (Figures A-2 and A-3).

The objective of the desktop review was to identify existing cultural resources within the Project Area and Study Area to inform project facility siting. Additionally, the Study Area was evaluated to gain an understanding of the type and density of cultural resources in the vicinity of the Project Area. This report summarizes the methods SWCA used to complete the desktop review and presents the results of the background research. It does not serve as Section 106 clearance for the proposed project.

2 REGULATORY FRAMEWORK

Projects in Michigan can come under the purview of two primary cultural resources regulations, the National Historic Preservation Act (NHPA) and Michigan's Natural Resources and Environmental Protection Act. Both are administered by the Michigan State Historic Preservation Office (MI SHPO).

If the project is deemed a federal undertaking (requiring a federal permit, license, or approval; being located on federally owned or managed land; or receiving federal financial assistance), a cultural resources survey most likely would be mandated to ensure compliance with Section 106 of the NHPA. The scope of required cultural resources surveys would then be determined by the functioning federal lead agency in cooperation with the MI SHPO and, if applicable, the pertinent Tribal Historic Preservation Offices as defined in both Section 101 of the National Environmental Policy Act and Section 106 of the NHPA.

Under Michigan law, the state oversees all archaeology performed on state land. The Natural Resources and Environmental Protection Act (Public Act 451 of 1994, Part 761) requires that a permit be obtained prior to undertaking any archaeological investigation on state land.

Public Act 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 megawatts or more, to wind projects with a capacity of 100 megawatts or more, and to energy storage facilities with a capacity of 50 megawatts or more. Public Act 233allows developers the option of applying to the Michigan Public Service Commission (MPSC) to construct utility-scale renewable energy facilities if the local unit of government does not have a compatible renewable energy ordinance. If a compatible renewable energy ordinance is in place, the developer must apply with the local unit of government first, but if the project is denied, the developer may submit to the MPSC for approval. Projects that fall into these categories must identify and provide information on the effects of the project on environmental, natural, and cultural resources.

The project will occur solely on privately held land; thus, no state or local laws requiring archaeological investigations or surveys are anticipated to apply for this project. However, Public Act 233 requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC.

3 METHODOLOGY

SWCA initially submitted a request for in-person research to the MI SHPO on April 7, 2023. Staff at the MI SHPO approved the request and scheduled a research appointment for April 20, 2023. An SWCA archaeologist obtained information in person on previous cultural resources surveys, previously recorded archaeological resources, and previously recorded postcontact architectural resources within the Study Area.

As the Project Area and Study Area were revised in fall 2024, SWCA submitted a second request to the MI SHPO for archaeology and survey site files within the revised Study Area. MI SHPO provided all available records on December 9, 2024. Due to the ongoing updates to the MI SHPO's database, a process that was initiated on February 24, 2024, only archaeology files are currently available. Postcontact architecture files and both postcontact architectural and archaeological survey reports are not currently available as the MI SHPO are scanning these files for upload into a new database. As such, SWCA relied on the April 2023 postcontact architectural resource files and survey reports for this review. SWCA additionally reviewed the National Register of Historic Places (NRHP) database for Michigan as the best available recent data regarding architectural resources.

In addition to the site file search, SWCA investigated historic plat and topographic maps and historic aerial imagery of the Project Area and Study Area. SWCA also researched environmental factors such as modern and historic land use and soil units mapped by the Natural Resources Conservation Service (NRCS) to determine the likelihood of the project to encounter previously unrecorded precontact or postcontact archaeological resources.

4 RESULTS

4.1 Physiography, Geology, and Soils

The Project Area is situated within the Erie-Huron Lake Plain of the Eastern Lake section of the Central Lowland province of the Interior Plains (NRCS 2022:343). The Erie-Huron Lake Plain is a fairly level glacial lake plain with scattered sandy ridges formed by former shorelines and moraines. Elevation ranges from approximately 570 to 815 feet (175 to 250 meters [m]), whereas local relief averages 10 feet (3 m). Major confluences in the Erie-Huron Lake Plain include the Clinton, Huron, and Saginaw Rivers, which empty into the Great Lakes. The Project Area is located within the Floodwood Creek-River Raisin watershed and the Big Meadow Drain-Black Creek watershed, which empty into the River Raisin (U.S. Environmental Protection Agency 2023). Mississippian- to Silurian-age limestone, shale, and dolomite are common along the surface and along the shores of Lake Erie and Lake Huron. Broad, level, and somewhat poorly drained lake plains feature American beech, sugar maple, silver maple, green ash, pin oak, swamp white oak, and American elm, whereas sandy areas feature eastern white pine, eastern hemlock, and other coniferous trees (NRCS 2022:344).

This ecoregion is also part of the Maumee Lake Plain and the Ann Arbor Moraines sub-subsections. The Maumee Lake Plain is a broad, flat, glaciated clay lake plain with rich, loamy soils deeply mantled by till and outwash and dissected by broad glacial drainageways containing sandy soils (Albert 1995). This region formerly included beech-sugar maple forest, elm-ash forest, deciduous swamps, white oak-black oak savannas, wet prairies, and coastal marshes, but now has been largely cultivated (Albert 1995; NRCS 2022). The Ann Arbor Moraines sub-subsection is a long, narrow band of fine- and medium-textured end and ground moraine bordered by flat lake plain on the east and by sandy outwash, end moraine, and ice-contact features to the west. This region formerly supported oak and oak-hickory forests, with oak

savannas along the western edge (Albert 1995). Major wildlife species in the Erie-Huron Lake Plain area include white-tailed deer; cottontail rabbits; squirrels; raccoons; pheasants; bobwhite quail; songbirds; various species of snakes, frogs, and turtles; sunfish; perch; bass; walleye; catfish; carp, sucker; and northern pike.

There are 40 soil series mapped within the Project Area by the NRCS (Table 1). The soils range from very poorly drained to excessively drained loams to sandy loams. The most common soils for the Project Area include Brady and Macomb loams, 0 to 3 percent slopes; Colwood very fine sandy loam, 0 to 3 percent slopes; Wauseon loam, 0 to 3 percent slopes; Ziegenfuss clay loam, 0 to 1 percent slopes; Brady and Macomb sandy loams, 0 to 3 percent slopes; and Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes. These soil types, and their implication for site formation processes and archaeological potential, are discussed further in Section 4.6.

Table 1. Soils within the Project Area

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
BbA	Berrien loamy sand, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BbB	Berrien loamy sand, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcA	Berrien sandy loam, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcB	Berrien sandy loam, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BhA	Brady sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on strand plains	Loamy over sandy and gravelly glaciofluvial deposits
BkA	Brady and Macomb loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BnA	Bronson sandy loam, 0 to 3 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BnB	Bronson sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BoA	Brookston loam, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
CbB	Cadmus sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over loamy till
CeA	Colwood very fine sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CgA	Conover loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Loamy till
GbA	Genesee sandy loam, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
GcA	Genesee and Eel loams, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GgA	Griffin and Sloan loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Clayey till
KbC	Kendallville sandy loam, 7 to 15 percent slopes	Well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over till
KeA	Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on deltas	Stratified loamy glaciofluvial deposits
LcA	Linwood muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Wood organic material over loamy till
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Drainageways on till-floored lake plains	Sandy and/or loamy glaciofluvial deposits over loamy till
NaA	Nappanee silt loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Clayey till
NbB	Nappanee loam, 3 to 7 percent slopes	Somewhat poorly drained	Knolls on ground moraines	Clayey till
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	Somewhat poorly drained	Knolls on ground moraines	Clayey till
OcC	Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded	Excessively drained	Beaches on till-floored lake plains	Glaciofluvial deposits and/or sandy glaciolacustrine deposits over loamy till
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	Poorly drained	Depressions on till plains	Loamy till
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PdB	Plainfield and Berrien loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PeB	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PwmaaA	Pewamo clay loam, dense substratum, 0 to 1 percent slopes	Poorly drained	Drainageways on nearshore zones (relict), flats on nearshore zones (relict)	Clayey till over dense till
RbA	Rollin muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Herbaceous organic material over marl
SbA	Sebewa sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on glacial drainage channels	Loamy over sandy and gravelly glaciofluvial deposits
Sf	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	Poorly drained	Drainageways on stream terraces, drainageways	Loamy drift over sandy and gravelly outwash
WcA	Wauseon loam, 0 to 3 percent slopes	Poorly drained	Depressions on till-floored lake plains	Glaciolacustrine deposits over clayey till

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	Poorly drained	Wave-worked till plains	Clayey till over loamy till
W	Water	N/A	N/A	N/A

Source: NRCS (2024).

4.2 Historical Land Use

SWCA reviewed historic plat and topographic maps, as these sources provide information on past land use within the Project Area and Study Area that may indicate the probability of encountering significant precontact and postcontact cultural resources in or near the Project Area. The historic maps indicate that there has been a general consistency in the road network and land-use patterns from the late nineteenth century into the modern era in the Study Area.

The earliest available map of the Project Area is an 1819 General Land Office survey map (Bureau of Land Management General Land Office 2024). The Project Area is uninhabited. The River Raisin is drawn as a winding water course east of the Project Area. There are patches of marshlands, and tributaries are marked but not fully drawn. No structures are depicted. Palmyra and Lenawee Junction have not yet been established.

The first available plat map, dated 1874, shows that the Project Area and Study Area had been divided into large landholdings. Residences, schools, and churches are depicted. Roads and three railroads also are in place, including the Lenawee County Railroad and Palmyra Road. The current U.S. Highway 233 is shown as a railroad. Several structures are depicted on landholdings within the Project Area. Some of these structures are adjacent to orchards or small agricultural fields. There are branches of unnamed tributaries flowing throughout the Project Area, one of which is the modern Big Meadow Drain (Everts and Stewart 1874).

By 1893, the Project Area is depicted similarly to the 1874 plat. More landowners have appeared, represented by smaller landholdings, and structures are depicted within the Project Area. The unnamed tributaries are still depicted, running through the central and southern portions of the Project Area (Cadwell 1893).

The 1916 plat map shows an increase in landowners once more as the communities of Lenawee Junction and Palmyra continue to grow. Structures also are depicted on these parcels in the Project Area and are shown mostly along roads. U.S. Highway 233 is depicted as the Toledo Western electric railroad. There is another railroad that runs north-south to the Toledo Western electric railroad, connecting from Adrian to Palmyra within the Project Area. This segment of rail had been a road on the 1874 and 1893 plat maps. Several tributaries also are shown within the Project Area (Ogle 1916).

The 1921 plat map does not show individual structures beyond churches and schools, neither of which are in the Project Area. Landowner names are given, and the road network and railroads appear in the same location as on previous plats (*Adrian Daily Telegram* 1921). The 1928 plat presents the same information (*Adrian Daily Telegram* 1928).

SWCA also reviewed historic topographic maps to determine the land use of the Project Area and Study Area. Four historic topographic maps from 1939 to 1972 show that there has been little development from the early twentieth century to the present (U.S. Geological Survey [USGS] 2024). On the earliest available topographic map (Blissfield, Michigan, 1939, 1958 edition), multiple structures are shown in the

Project Area along roadways. The tributaries shown on the plat maps are named and shown: Big Meadow Drain, Bixby Drain, and Grinnell Drain. The road network and railroads are also depicted. The 1941 Blissfield, Michigan, topographic map reveals a similar image. The 1972 Palmyra, Michigan, and 1972 Tecumseh South, Michigan, topographic quadrangles name most of the roads in the Project Area, and they show that residential development had not increased outside of Palmyra and Adrian. Transmission and telecommunication cables are also depicted (USGS 2024).

A review of 17 aerial photographs taken between 1955 and 2022 indicates that minimal land development occurred within the Project Area and its environs. On the aerial images beginning in 1955, the landscape is agricultural. Isolated farmsteads are visible along roadways outside of Palmyra, Lenawee Junction, and Adrian. Drainages are visible either as scars on the landscape or are lined with trees, as is the River Raisin. There are some stands of trees throughout the Project Area. Between 1955 and 2022, no noticeable changes occur to the land use in the Project Area or Study Area (Historic Aerials 2024).

4.3 Previous Cultural Resources Surveys

A review of MI SHPO records identified one cultural resources survey that was conducted in the Project Area and two cultural resources surveys conducted within the Study Area (Table 2). Project ER00-7.17.161134 was a reconnaissance investigation conducted in 2017 by Archaeological Consultants of Ossian. The survey area covered 0.44 acre of land, and no cultural resources were identified during the survey (Stillwell 2017). Project ER17-391 was conducted for the Howard Street/West Michigan CMAQ and Rehabilitation project; however, the MI SHPO records did not contain information on the surveyors, year, or report title. Project B17-258, identified on quad maps in the MI SHPO research repository as Lauterbur 2016, was a Phase I archaeological survey conducted in support of the replacement of the River Raisin Bridge in Palmyra, Michigan. The MI SHPO records did not include information on the extent of the survey; however, no archaeological sites were identified during the survey.

Table 2. Previous Cultural Resources Surveys in the Study Area

Project ID	Project Name	Survey Year	Surveyors	Report Title	Location
ER00-7.17.161134	G2 Cellular Tower Site Review #161134	2017	Archaeological Consultants of Ossian	*An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project #161134) in Palmyra, Lenawee Conty, Michigan. 17FR29Mi.*	Project Area
ER17-391	Howard Street/ West Michigan CMAQ and Rehabilitation	None recorded	None recorded	None recorded	Study Area
B17-258	Lauterbur 2016	2016	Michigan Department of Transportation	*Archaeological Investigations at US-223 River Raisin Bridge Replacement, Palmyra, Lenawee County.*	Study Area

4.4 Previously Recorded Archaeological Sites

[redacted]

[redacted]

4.5 Previously Recorded Architectural Resources and Cemeteries

SWCA reviewed the National Park Service's NRHP database for Lenawee County, Michigan, regarding information on historic districts, buildings, archaeological sites, and other properties eligible for or listed in the NRHP. The NRHP database did not identify any NRHP-listed resources within the Project Area (National Park Service 2024).

SWCA also reviewed historic architecture data provided by the MI SHPO in April 2023. No previously recorded architectural resources are located within the Project Area; three architectural resources are located in the Study Area (Table 4; Appendix A: Figure 5).

No recorded cemeteries are present in the Project Area; two postcontact cemeteries (Palmyra Village Cemetery and Crane Cemetery) are located within the Study Area (Table 5; Appendix A: Figure 5). Palmyra Village Cemetery was included in the MI SHPO site file data, while Crane Cemetery was identified through archival research of historic topographic maps. Due to the data gap in the MI SHPO site file records since February 2024, it is not clear if Crane Cemetery is still absent from MI SHPO site file records.

Table 4. Previously Recorded Historic Architectural Resources in the Study Area

Site ID	Historic Name	City	NRHP Status	Location
P23943	Palmyra Presbyterian Church	Palmyra	Unevaluated	Study Area
P61449	Bruce Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area
P61451	Scott Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area

Table 5. Previously Recorded Cemeteries in the Study Area

Historic Name	Record Source	Location
Palmyra Village Cemetery	MI SHPO site file data	Study Area
Crane Cemetery	Archival research	Study Area

4.6 Geoarchaeology

Geoarchaeology, which is a multidisciplinary field that incorporates topography, geomorphology, geology, and soils, helps archaeologists to understand how geological processes have influenced the preservation of archaeological sites. Research conducted by Monaghan and Lovis (2005) demonstrates that deeply buried soils have an increased probability of sustaining cultural resources where fluvial deposits overlie alluvial deposits as a result of waterways breaching their banks. Monaghan and Lovis developed a predictive geoarchaeological model that takes these effects into account and classifies an area's likelihood of having cultural resources from Low to High-Very High.

Based on the Monaghan and Lovis (2005) model, the Project Area intersects with areas modeled as having moderate to high potential for deeply buried archaeological deposits (Figure A-6). [redacted] Otherwise, the remainder of the Project Area is largely mapped as exhibiting a low potential for deeply buried archaeological deposits.

[redacted]

4.7 Cultural Resources Context and Potential

The potential of the Project Area to contain cultural resources was developed through examination of the natural and topographical characteristics of the Project Area and available historic-era maps and aerial photographs.

4.7.1 Potential for Precontact Archaeological Sites

[redacted]

4.7.2 Potential for Postcontact Archaeological Sites

[redacted]

5 SUMMARY AND RECOMMENDATIONS

In summary, the records review established that one cultural resources survey has been conducted previously within the Project Area, and two cultural resources surveys have been conducted in the Study Area. These compliance surveys were negative and did not result in the recordation of cultural resources within the Project Area or the Study Area. However, [redacted] None of the archaeological sites within the Project Area have been evaluated for listing in the NRHP. There are no previously recorded architectural resources within the Project Area and three architectural resources in the Study Area. Based on MI SHPO records and a review of the NRHP, there are no NRHP-listed resources located within the Project Area or Study Area.

There is an overall moderate probability for significant precontact archaeological sites and a low to moderate probability for significant postcontact archaeological sites within the Project Area. [redacted]

Should the project require archaeological survey, the geoarchaeological modeling (Monaghan and Lovis 2005) suggests that shovel testing and/or deep testing (e.g., auguring) may be necessary [redacted] Pedestrian survey is a viable survey methodology as long as alluvial soils are confined to the plow zone (e.g., 12 inches [30 centimeters]); the limits of shovel testing is typically 3 feet (1 m).

Based on the MPSC regulations and our communications with the MI SHPO (personal communication, Sarah Surface-Evans and Scott Slagor, January 30, 2025), SWCA recommends initiating consultation with the MI SHPO. SWCA understands that MI SHPO has initiated a new consultation process for projects subject to permitting through the MPSC, and that the MI SHPO will provide expert testimony regarding cultural resources to the MPSC. To initiate the consultation process, the MI SHPO requests developers to complete a consultation application, in coordination with a professional archaeologist and architectural historian, The MI SHPO will provide their recommendations for next steps, including survey and avoidance requirements. SWCA understands that RWE will have 1 year after submittal of the MPSC permit application to obtain the approval of survey reports or recommendations submitted to the SHPO.

In keeping with Public Act 233, which requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC, SWCA recommends this document be provided to the MPSC for review. Approval from the MPSC is required before development within the boundaries of these sites occurs.

6 REFERENCES CITED

Adrian Daily Telegram. 1921. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21190/Palmyra+Township/Lenawee+County+1921/Michigan/. Accessed November 14, 2024.

———. 1928. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/1610467/Palmyra+Township++Raisin+River/. Accessed November 14, 2024.

Albert, Dennis A. 1995. Regional landscape ecosystems of Michigan, Minnesota and Wisconsin: A working map and classification. General Technical Report NC-178. U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota. Available at: https://www.nrs.fs.usda.gov/pubs/gtr/other/gtr-nc178/index.html. Accessed November 1, 2024.

Bureau of Land Management General Land Office. 2024. Original Survey Plat, Township 7 North, Range 4 East, 3rd Principal Meridian. Available at: https://glorecords.blm.gov/details/survey/default.aspx?dm_id=27676&sid=usa5y3jo.a4o#surveyDetailsTabIndex=0. Accessed November 14, 2024.

Cadwell, George D. 1893. Atlas of Lenawee County, Michigan. Geo. D. Cadwell and Company, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21077/Palmyra+Township/Lenawee+County+1893/Michigan/. Accessed November 14, 2024.

Everts and Stewart. 1874. Combination Atlas Map of Lenawee County, Michigan. Everts and Stewart, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/20906/Palmyra+Township/. Accessed November 14, 2024.

Historic Aerials. 2024. Historic Aerials Viewer. Available at: https://www.historicaerials.com/viewer. Accessed November 14, 2024.

Monaghan, G. William, and William A. Lovis. 2005. *Modeling Archaeological Site Burial in Southern Michigan: A Geoarchaeological Synthesis*. Michigan State University Press, East Lansing.

National Park Service. 2024. National Register of Historic Places Database and Research. Available at: https://www.nps.gov/subjects/nationalregister/database-research.htm. Accessed January 13, 2025.

Natural Resources Conservation Service (NRCS). 2022. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. Washington, D.C.

———. 2024. Custom Soil Report. Available at: http://websoilsurvey.nrcs.usda.gov. Accessed December 12, 2024.

Ogle, George A. 1916. Standards Atlas of Lenawee County, Michigan. Geo. A. Ogle Publishers and Engravers, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/22243/Palmyra+Township/Lenawee+County+1916/Michigan/. Accessed November 14, 2024.

Stillwell, Larry N. 2017. *An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project No. 161134) in Palmyra, Lenawee County, Michigan*. Archaeological Consultants of Ossian. On file at the Michigan State Historic Preservation Office, Lansing, Michigan.

U.S. Environmental Protection Agency. 2023. How's My Waterway Viewer. Available at: https://mywaterway.epa.gov/. Accessed November 14, 2024.

U.S. Geological Survey (USGS). 2024. National Geologic Map Database Project TopoView. Available at: https://ngmdb.usgs.gov/topoview/viewer/#14/41.8731/-83.9695. Accessed November 14, 2024.

APPENDIX A

Figures

Figure A-1. Location of the proposed Rouget Road, LLC Area in Michigan.

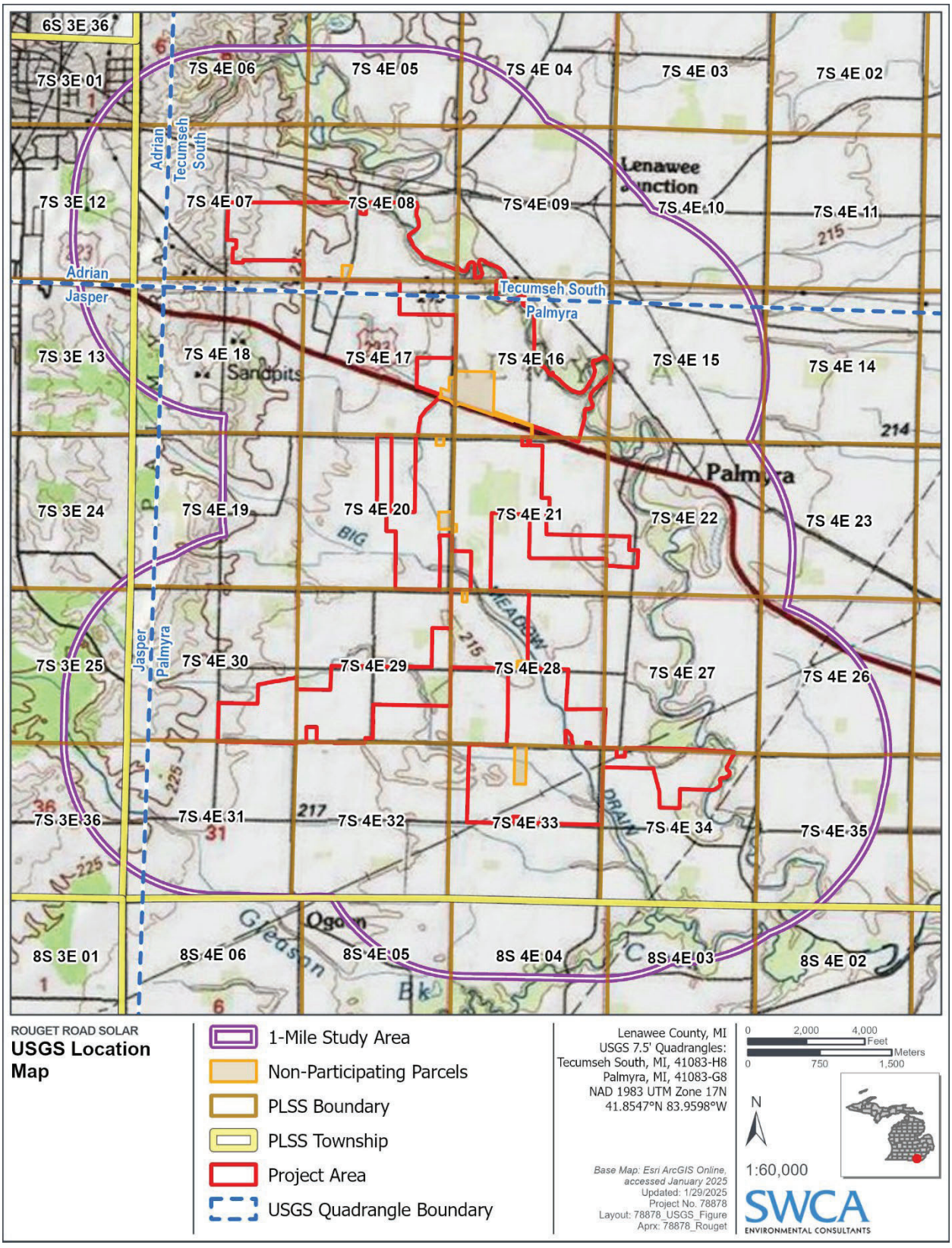

Figure A-2. Location of the Study Area for the proposed Rouget Road, LLC on a USGS topographic map.

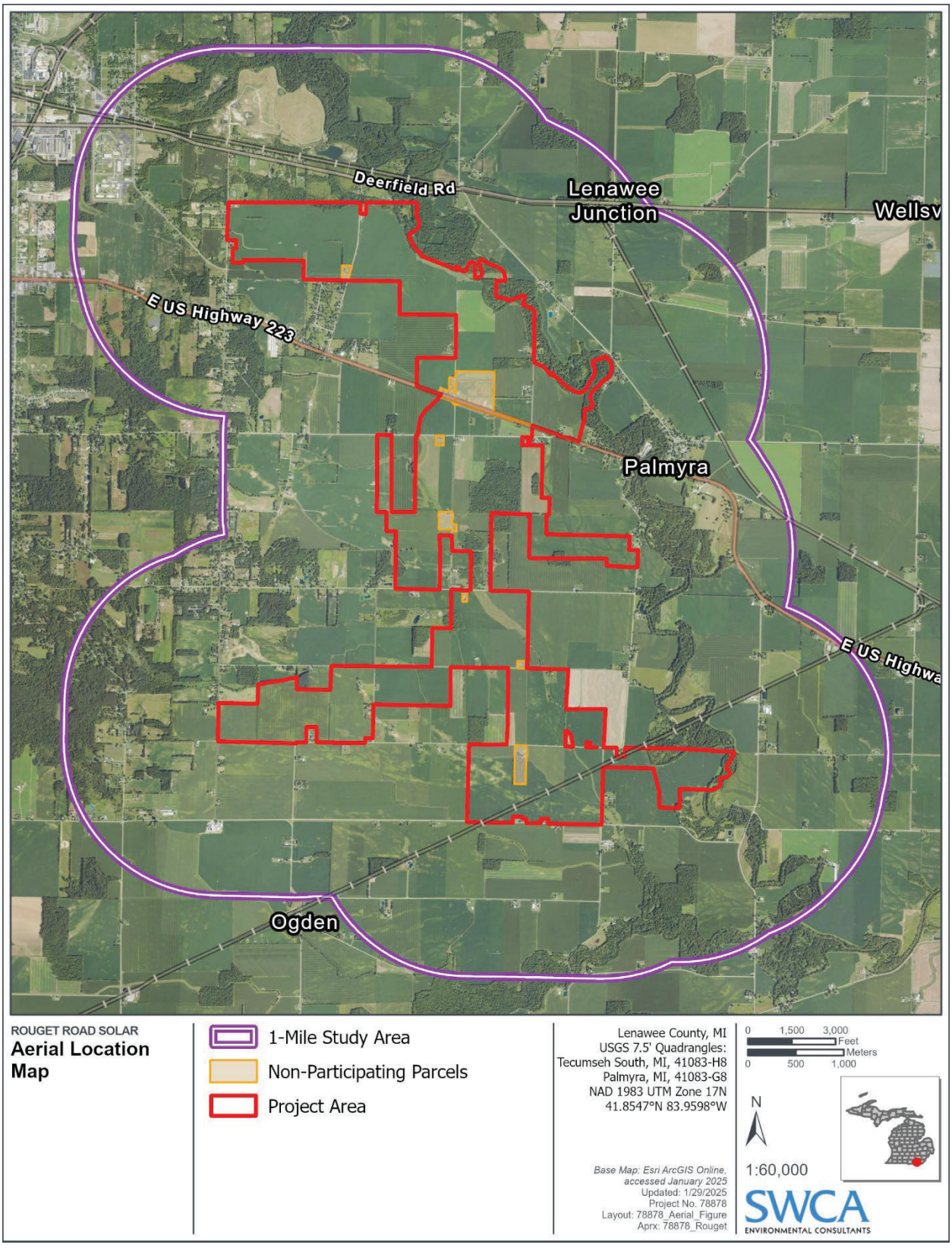

Figure A-3. Overview of the Study Area for the proposed Rouget Road, LLC on aerial imagery.

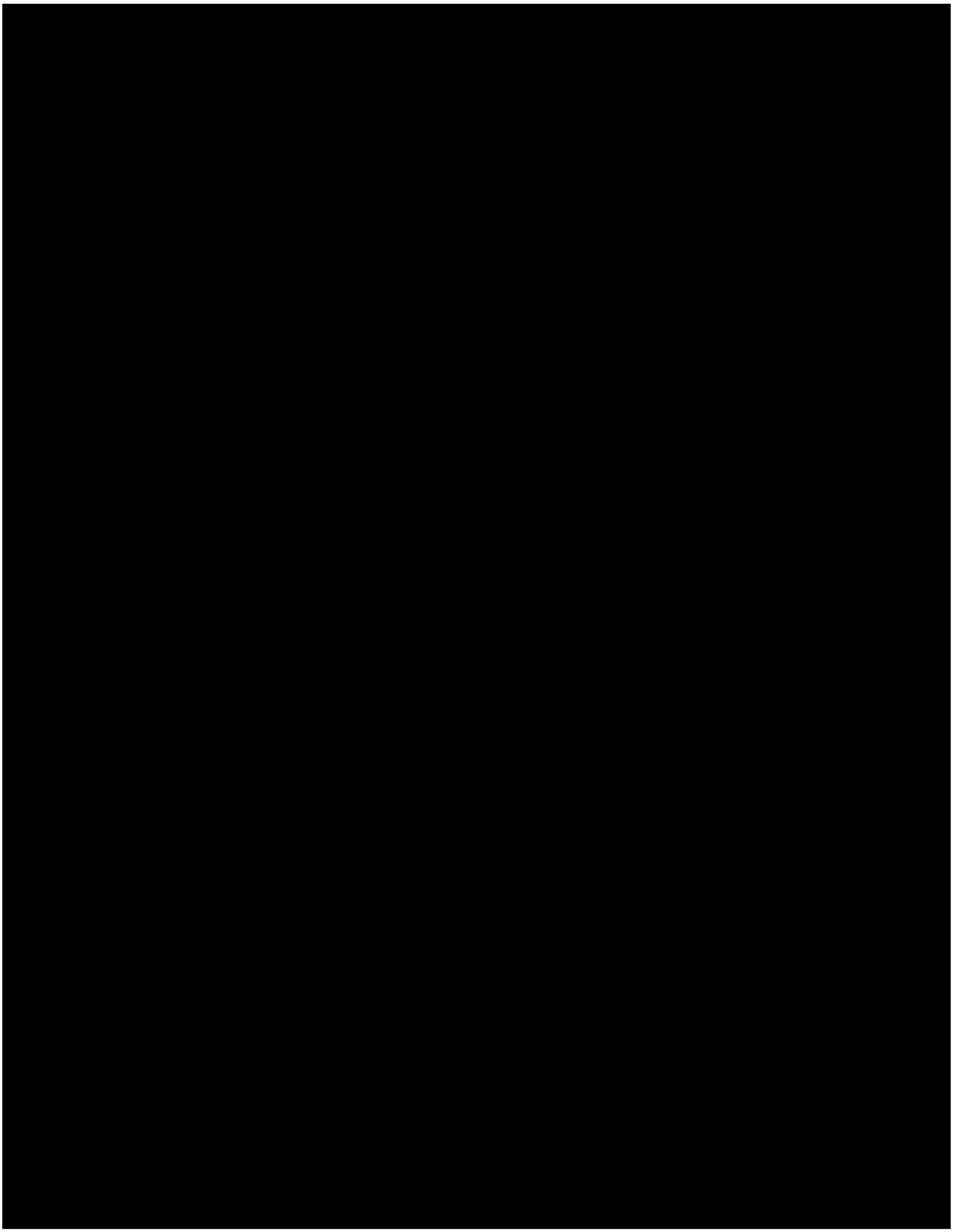

Figure A-4. Results of the background research for previously recorded cultural resources and previously conducted surveys.

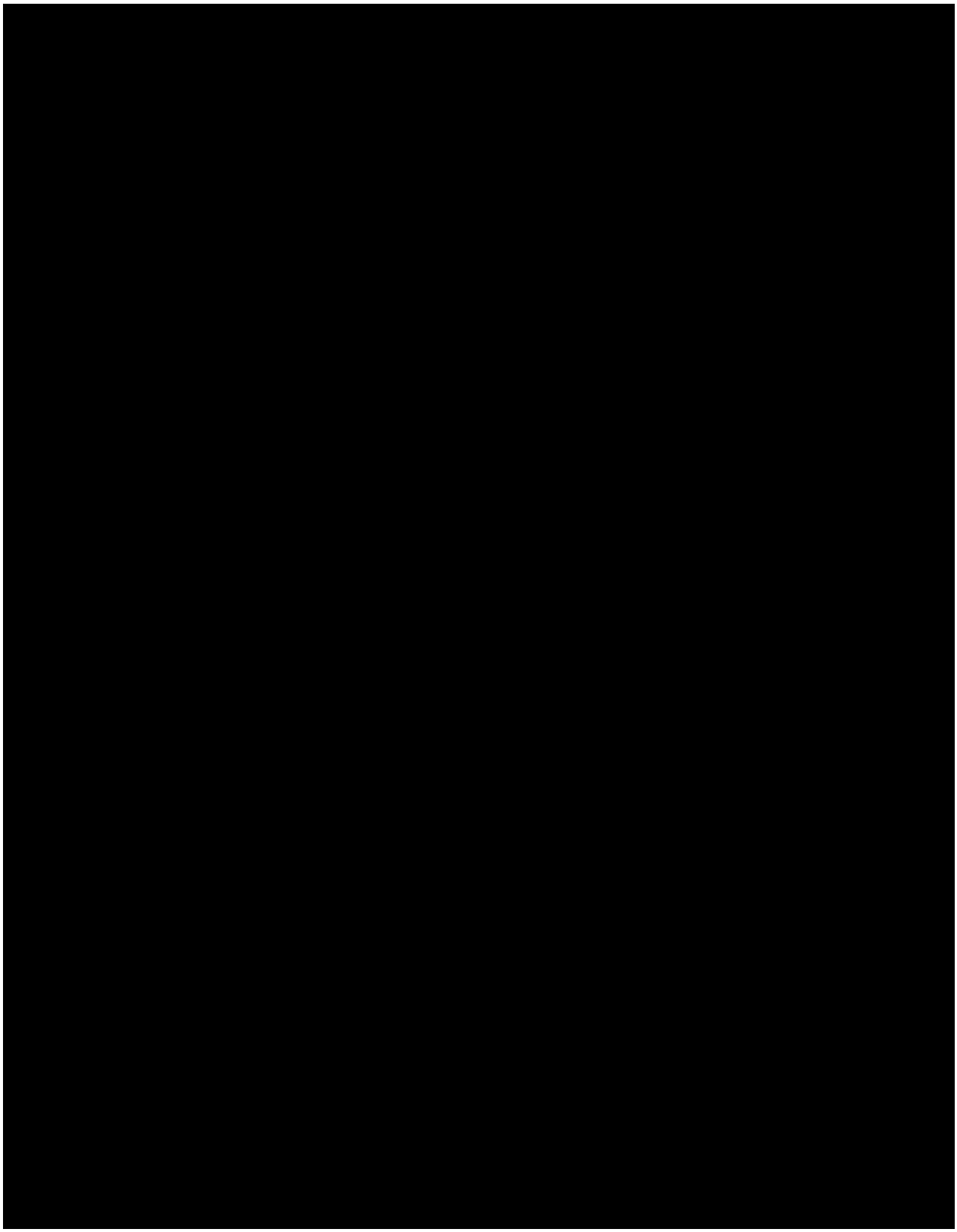

Figure A-5. Results of the background research for postcontact architectural resources and cemeteries.

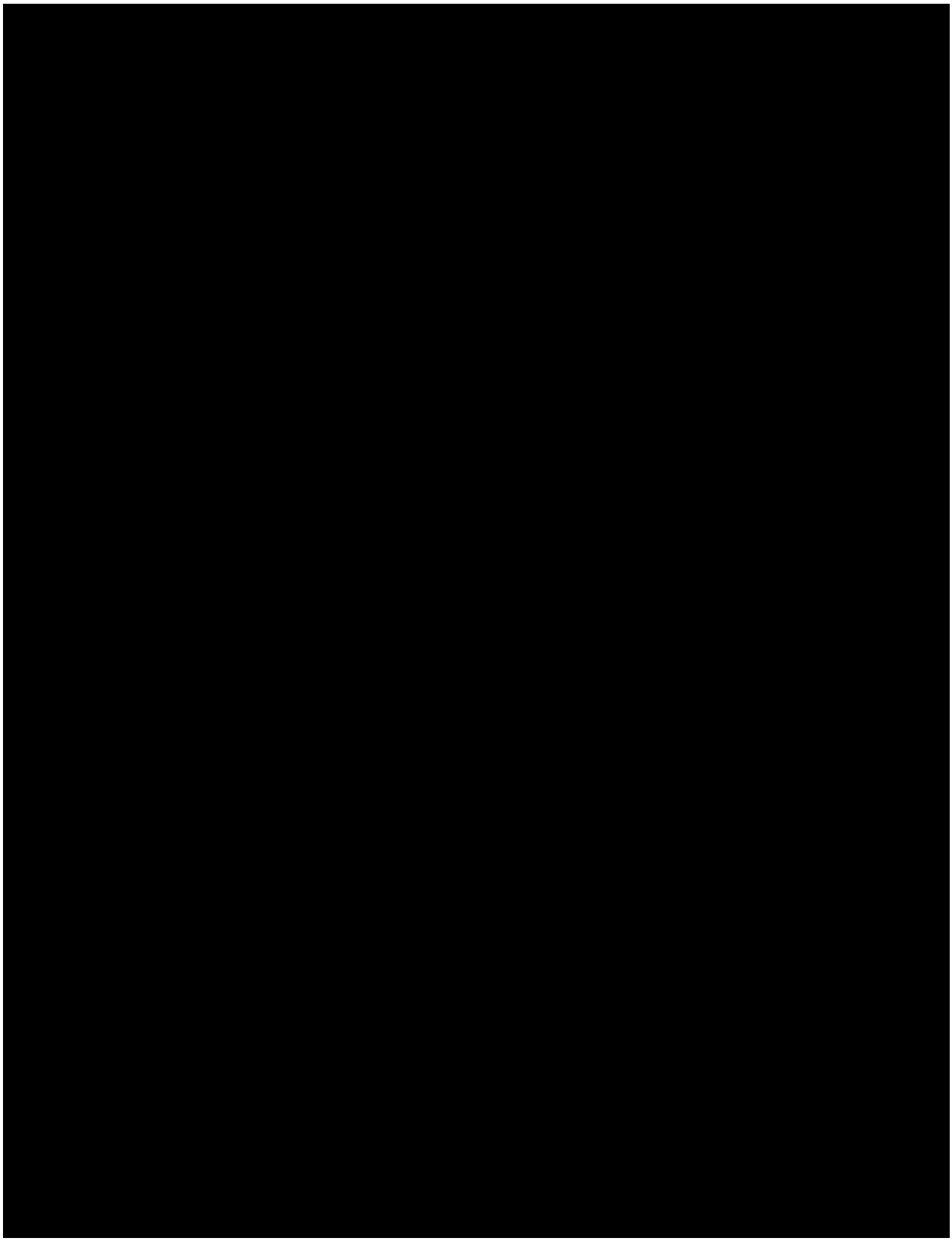

Figure A-6. Areas modeled as having moderate to high potential for deeply buried archaeological deposits in the Project Area and Study Area.

GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
MICHIGAN STRATEGIC FUND
STATE HISTORIC PRESERVATION OFFICE

QUENTIN L. MESSER, JR.
PRESIDENT

September 10, 2025

KEVIN COLE
ROUGET ROAD LLC
10250 PENLAWN DR.
JEROME, MI 49249

RE: SR25-23 PA233 Review Rouget Road, LLC Solar, T07S/R04E/Sec. 7, 8, 9, 15, 16, 17, 20 ,21, 22, 27, 28, 29, 30, 33, and 34, Palmyra Township, Lenawee County (MPSC)

Dear Mr. Cole:

We have received your request for review of the above-cited project under Public Act 233 of 2023 for Renewable Energy and Energy Storage Facility Siting (PA 233) at the above-noted location. We have reviewed the assessment prepared by SWCA, "Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan" and appreciate the information provided. To fully consider and address impacts to cultural and historic sites we require additional information, please send the following:

General

In the materials submitted, the project area boundaries in the submission form and in the Desktop Review do not match. Please ensure that we have the final project boundary maps included in all materials submitted to our office. Desktop Review states that the project plan will avoid archaeological sites, however, the project mapping provided does not make this apparent or clear. We cannot assess the impact of the proposed project on historic resources without accurate mapping information. Additionally, we would like to see the locations of staging areas, vehicle traffic, and any other areas that may have ground disturbance mapped.

Archaeological Resources

Due to the presence of previously documented sites within and near the project area, and the high archaeological sensitivity for the River Raisin valley generally, SHPO requests full archaeological survey for the entire project area, including staging areas. In particular, the boundaries of site 20LE28 are poorly delineated. In order to avoid this site, which is known to contain burials, additional survey methodologies may be necessary beyond pedestrian survey or shovel testing***. SHPO recommends consulting with our office and Tribal Nations with historic connections to this region to develop an appropriate methodology***, which may include geophysical prospection or historic human remains detection dog (HRD) survey. SHPO also recommends developing an Unanticipated Discovery Plan (UDP) for the project. A UDP specifies who will be contacted and what measures will be taken in the event of an unanticipated discovery of archaeological materials or human remains during the project implementation. Please see the UDP template attached, for an example of how these documents are organized. SHPO encourages the project proponent to work with consulting party tribes to develop an

appropriate UDP and protocol for handling human remains.

Above-ground Resources

SHPO concurs with the proposed methodology of utilizing the Above Ground Table in lieu of identification forms except that we require identification forms for properties that are identified as eligible. The table does not provide enough information for eligible properties. For eligible properties, photographs of all resources must also be included in an attachment with Architectural Properties Identification Form. When discussing effects to above-ground resources, please be sure to provide discussion of visual impacts as well as visual barriers in place that may play in to effects determinations. Also be sure that the Historic Resource Survey Report contains enough history and contextual information about the area and resources for SHPO to adequately assess eligibility.

Additional information must be submitted online through our Additional Information Portal.

Please note that our review cannot proceed until we are able to consider the information requested above. This letter is not concurrence. If you have any questions, please contact please contact Senior Archaeologist, Sarah Surface-Evans, surfaceevanss1@michigan.gov, (517) 282-7959 or Historian, Katlyn Burns Yancho, at 517-256-3416, burnsyanchok@michigan.gov. **Please reference our project number in all communication with this office regarding this review.** Thank you for your consultation.

Sincerely,

Sarah Surface-Evans, PhD, RPA
Senior Archaeologist

SES:KAK:KBY:SSE

Enclosure(s): UDP Template

Copy: Anna Gilmer, SWCA

Little Traverse Bay Bands of Odawa Indians, Michigan

From:	Jonathan Libbon
To:	"mwright@ltbbodawa-nsn.gov"
Cc:	Carol Mcknight; Aleyda Galan; Cole, J Kevin; Quarles, Mark; Anna Gilmer
Subject:	Rouget Road Solar Consultation Letter
Date:	Thursday, November 20, 2025 5:01:00 PM
Attachments:	Rouget Tribal Consulation LTR_20Nov2025.pdf image001.png
Sensitivity:	Private

Good Afternoon Mae,

On behalf of Rouget Road Solar Farm LLC, a wholly-owned subsidiary of RWE Clean Energy LLC (RWE), we are reaching out to request your input on the Rouget Road Solar Farm Project, a proposed solar facility in Lenawee County, Michigan. The facility will require a state siting certificate from the Michigan Public Service Commission (MPSC). The attached letter and documentation outline the project and provide details on the cultural resource work completed to date. We are seeking comments from your area of expertise regarding any potential environmental or cultural effects associated with this project.

Please let me or Kevin Cole (cc'd), the project manager from RWE, know if you have any questions about the project.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

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11/20/2025

Dear Tribal Historic Preservation Officer and/or Tribal Cultural Representative,

As part of its responsibilities under Michigan Public Act 233 of 2023 (PA 233), *Renewable Energy and Energy Storage Facility Siting*, the Michigan Public Service Commission (MPSC) is seeking consultation (as required in PA 233 Section 224.1b[1]) and determining the area of potential effects ("APE") for the proposed project. Federally listed sovereign Nations with an interest in the state of Michigan are invited to review and comment on Rouget Road Solar Farm, LLC's (Rouget Road Solar Farm) (a wholly-owned subsidiary of RWE Clean Energy LLC [RWE]) proposed **Rouget Road Solar Farm Project** (the "Project"). The proposed Project will require a state-siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC (PA 233 Section 226.7b). Although Rouget Road Solar Farm requests a review and comment on the Project, the MPSC is the state agency and may be communicated with directly.

Based on Michigan State Historic Preservation Office (MI SHPO) guidance from their *Instructions for the Application for PA 233 Renewable Energy Storage Facility Siting Consultation Form*:

> "**Public Act 233** requires the applicant for energy siting and storage facilities to consider and address impacts *to the environment and natural resources, including, but not limited to, sensitive habitats and waterways, wetlands and floodplains, wildlife corridors, parks,* ***historic and cultural sites****, and threatened or endangered species*. The applicant must submit this information to the Michigan Public Service Commission (MPSC) for consideration in permitting the project. In order to facilitate considerations of historic and cultural sites (hereafter Historic Properties), the MPSC has required applicants to consult with the State Historic Preservation Office (SHPO)."

This letter is part of the early coordination phase of the environmental review process, requesting comments associated with this Project. We are requesting comments from your area of expertise regarding any possible environmental or cultural effects associated with this Project. Please provide any additional information you may have regarding potential cultural resources in the Project area so they may be accounted for during the environmental review of this Project. This information can be provided directly to RWE or the MPSC.

Project Description

The proposed Project is southeast of the city of Adrian, in Palmyra Township, Lenawee County, Michigan (Figure 1). Historic Mapping places the proposed Project area in Sections 7, 8, 9, 15, 16, 17, 20, 21, 22, 27, 28, 29, 30, 33, and 34 of Township 7 South, Range 4 East as seen on the enclosed USGS 7.5 series for Tecumseh South and Palmyra, Michigan Topographic Quadrangle map (Figure 2). Rouget Road Solar Farm is proposing to construct a 175-megawatt (MW) alternating current (AC) solar photovoltaic power generating facility. The leased area/Project area boundary includes approximately 2,142 acres (867 hectares) (Figures 2 and 3). Construction will require 1,513 acres (612 ha) of what is currently primarily agricultural land (see site plan boundary in Figure 1). Limited tree removal is planned across 7.96 acres (3.22 ha). Proposed work required for the Project includes construction of a switchyard, substations, access

[1] Sections refer to those found at: https://www.legislature.mi.gov/documents/2023-2024/publicact/htm/2023-PA-0233.htm

roads, fencing, MV electrical cabling, and solar panel structures. Construction may also include an operations and maintenance building.

Project Permitting
The proposed Project will require a siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC.

PA 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 MW or more, to wind projects with a capacity of 100 MW or more, and energy storage facilities with a capacity of 50 MW or more. Projects that fall into these categories must identify and provide information on the effects of the Project on environmental, natural, and cultural resources. Additional PA 233 information is available online at State Project Reviews | MiPlace[2], and a Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the MPSC is available online at Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the Michigan Public Service Commission. [3]

Cultural Resource Investigations
The APE is the area in which the proposed Project may cause alterations in the character or use of historic resources. As the site plan boundary includes all locations that may be impacted by ground disturbing activities related to the project undertaking, it is considered the physical APE (see Figure 1). The visual APE for assessing visual effects to historic-age resources is a 0.5-mile buffer from the boundaries of the Project area (e.g., leased area/project boundary) (see Figure 2). This boundary will be modified based on visual intrusions that may obscure the project.

Rouget Road Solar Farm has contracted SWCA Environmental Consultants (SWCA) to conduct the archaeological and architectural history surveys. Due to the presence of previously--documented archaeology sites in and near the Project area, and the archaeological sensitivity for the River Raisin Valley, SWCA will conduct a full archaeological survey for the physical APE, including staging areas. The boundaries of [redacted], is mapped as lying within the proposed Project area; however, these site boundaries are mapped based off archival records and the extent of the complex is poorly understood. In order to be sensitive toward this [redacted], we are asking for your input on the extent of the complex and the survey methodologies that may be necessary beyond [redacted] An Unanticipated Discoveries Plan (Exhibit A-1.14 in the MPSC permit application) has been prepared.

Summary of Requested Action
We look forward to consulting with your office on this Project and to a continued dialogue. We ask that you provide any comments regarding the Project area following your review of the enclosure. Please use the above Project name and Project description in your reply.

In summary, the MPSC and Rouget Road Solar Farm are requesting Tribal Governments to:

[2] https://www.miplace.org/historic-preservation/programs-and-services/cultural-resource-management-and-planning/state-project-reviews/

[3] https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/consumer/MPSC_Tribal_Involvement_Guide.pdf?rev=399582a67fbe46e883e6f21d1325e785&hash=AA471378E81539AFBBA758AB04FB3D25

1. Review the Project information.
2. Identify cultural or environmental concerns.
3. Provide feedback on archaeological methodologies (especially near site 20LE28).
4. Ensure that any cultural resources are addressed in the MPSC permitting process.

All comments will be documented and considered in Project design and the forthcoming MPSC state siting process. Consultation with SHPO and the THPOs included in the distribution list below will be incorporated into the cultural survey plan, recordation, and design updates as needed. Your timely response will greatly help us incorporate your concerns into the development of the Project. For that purpose, we request that you provide comments by December 20, 2025.

Tribal consulting parties may respond to myself (Kevin Cole) at rougetroadsola@rwe.com with any comments or concerns. Alternatively, you can reach out directly to Gustavo Cordero at the MPSC at corderog@michigan.gov.

Respectfully,

Kevin Cole
RWE Development Manager
rougetroadsola@rwe.com

cc: Gustavo Cordero, Michigan Public Service Commission
Carol McKnight, SWCA Environmental Consultants
Anna Gilmer, SWCA Environmental Consultants

Distribution List:
Forest County Potawatomi Community, Wisconsin
Hannahville Indian Community, Michigan
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
Little Traverse Bay Bands of Odawa Indians, Michigan
Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan
Menominee Indian Tribe of Wisconsin
Miami Tribe of Oklahoma
Pokagon Band of Potawatomi Indians, Michigan and Indiana
Sault Ste. Marie Tribe of Chippewa Indians, Michigan
Seneca-Cayuga Nation

Enclosures:
1. Figures
    a. Figure 1: State location map
    b. Figure 2: Portions of the USGS 7.5' series Tecumseh South and Palmyra Michigan Topographic Quadrangles showing the Project area.
    c. Figure 3: Aerial view of the Project area location in Palmyra Township, Lenawee County, Michigan.
2. Cultural Desktop Report
3. SHPO PA233 Response

Figure 1. Location of the proposed Rouget Road Solar Project Area in Michigan.

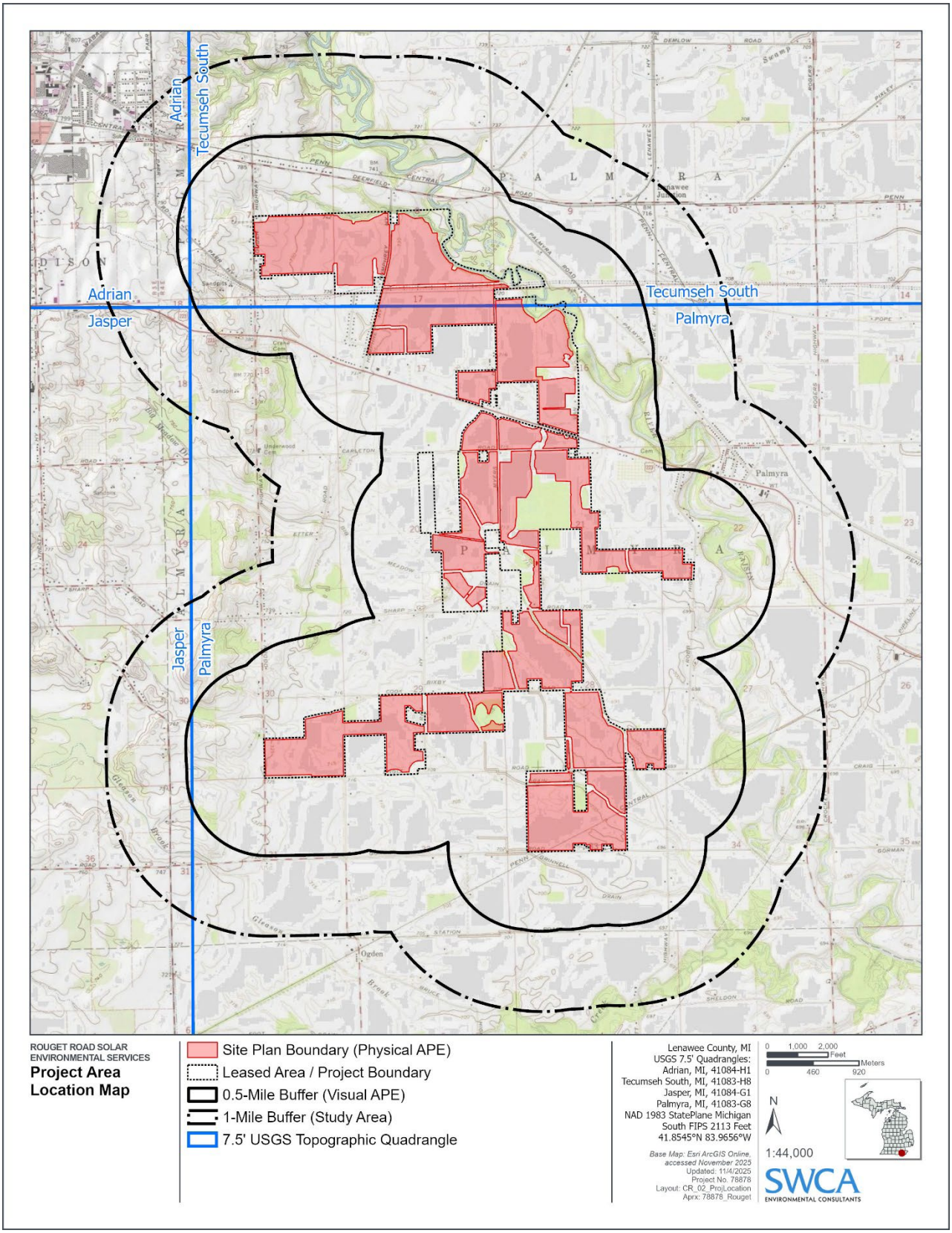

Figure 2. Portions of the USGS 7.5' series Tecumseh South and Palmyra, Michigan Topographic Quadrangles showing the site plan boundary and leased area/Project boundary.

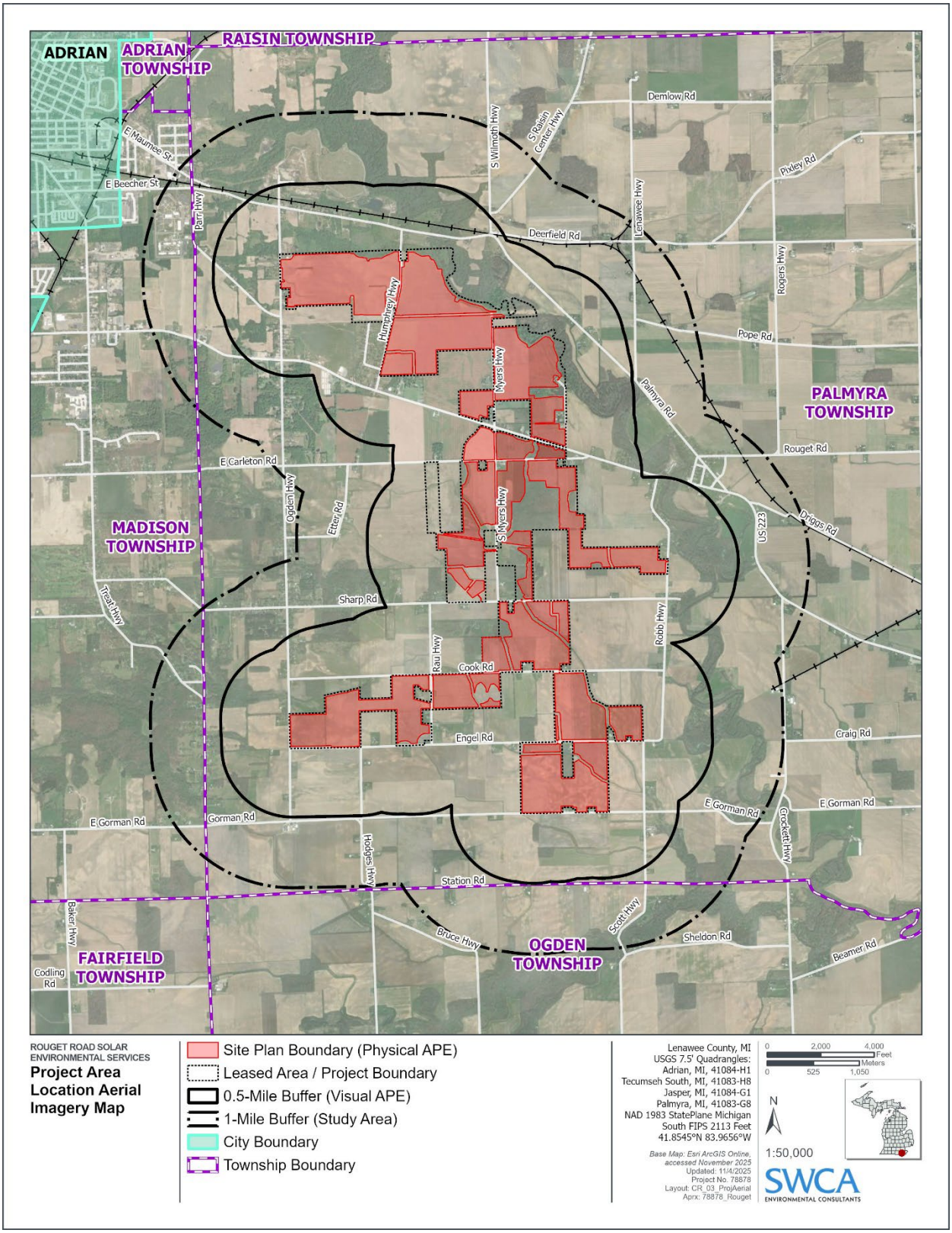

Figure 3. Aerial view showing the site plan boundary and leased area/Project boundary in Palmyra Township, Lenawee County, Michigan.

Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan

JANUARY 2025

PREPARED FOR

Rouget Road, LLC

PREPARED BY

SWCA Environmental Consultants

CULTURAL RESOURCES DESKTOP REVIEW FOR THE ROUGET ROAD, LLC LENAWEE COUNTY, MICHIGAN

Prepared for

Rouget Road, LLC
353 North Clark Street, 30th Floor
Chicago, Illinois 60654
Attn: J Kevin Cole

Prepared by

Rachel Lawrence, M.A., RPA
Heather MacIsaac, B.A.

and

Anna Gilmer, M.A., RPA

SWCA Environmental Consultants
200 22nd Street, Suite 220
Lombard, Illinois 60148
(630) 705-1762
www.swca.com

SWCA Project No. 78878

SWCA Cultural Resources Report No. 25-27

January 2025

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1 INTRODUCTION

SWCA Environmental Consultants (SWCA) completed a cultural resources desktop review for the proposed Rouget Road, LLC (project), located in Lenawee County, Michigan (Figure A-1 in Appendix A). The Project Area spans approximately 2,490 acres (1,008 hectares) of privately owned land near the towns of Adrian, Palmyra, and Ogden. SWCA completed the desktop review for the Project Area plus a surrounding 1.0-mile (1.6-kilometer) buffer around the Project Area. The surrounding 1.0-mile buffer is henceforth referred to as the Study Area (Figures A-2 and A-3).

The objective of the desktop review was to identify existing cultural resources within the Project Area and Study Area to inform project facility siting. Additionally, the Study Area was evaluated to gain an understanding of the type and density of cultural resources in the vicinity of the Project Area. This report summarizes the methods SWCA used to complete the desktop review and presents the results of the background research. It does not serve as Section 106 clearance for the proposed project.

2 REGULATORY FRAMEWORK

Projects in Michigan can come under the purview of two primary cultural resources regulations, the National Historic Preservation Act (NHPA) and Michigan's Natural Resources and Environmental Protection Act. Both are administered by the Michigan State Historic Preservation Office (MI SHPO).

If the project is deemed a federal undertaking (requiring a federal permit, license, or approval; being located on federally owned or managed land; or receiving federal financial assistance), a cultural resources survey most likely would be mandated to ensure compliance with Section 106 of the NHPA. The scope of required cultural resources surveys would then be determined by the functioning federal lead agency in cooperation with the MI SHPO and, if applicable, the pertinent Tribal Historic Preservation Offices as defined in both Section 101 of the National Environmental Policy Act and Section 106 of the NHPA.

Under Michigan law, the state oversees all archaeology performed on state land. The Natural Resources and Environmental Protection Act (Public Act 451 of 1994, Part 761) requires that a permit be obtained prior to undertaking any archaeological investigation on state land.

Public Act 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 megawatts or more, to wind projects with a capacity of 100 megawatts or more, and to energy storage facilities with a capacity of 50 megawatts or more. Public Act 233allows developers the option of applying to the Michigan Public Service Commission (MPSC) to construct utility-scale renewable energy facilities if the local unit of government does not have a compatible renewable energy ordinance. If a compatible renewable energy ordinance is in place, the developer must apply with the local unit of government first, but if the project is denied, the developer may submit to the MPSC for approval. Projects that fall into these categories must identify and provide information on the effects of the project on environmental, natural, and cultural resources.

The project will occur solely on privately held land; thus, no state or local laws requiring archaeological investigations or surveys are anticipated to apply for this project. However, Public Act 233 requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC.

3 METHODOLOGY

SWCA initially submitted a request for in-person research to the MI SHPO on April 7, 2023. Staff at the MI SHPO approved the request and scheduled a research appointment for April 20, 2023. An SWCA archaeologist obtained information in person on previous cultural resources surveys, previously recorded archaeological resources, and previously recorded postcontact architectural resources within the Study Area.

As the Project Area and Study Area were revised in fall 2024, SWCA submitted a second request to the MI SHPO for archaeology and survey site files within the revised Study Area. MI SHPO provided all available records on December 9, 2024. Due to the ongoing updates to the MI SHPO's database, a process that was initiated on February 24, 2024, only archaeology files are currently available. Postcontact architecture files and both postcontact architectural and archaeological survey reports are not currently available as the MI SHPO are scanning these files for upload into a new database. As such, SWCA relied on the April 2023 postcontact architectural resource files and survey reports for this review. SWCA additionally reviewed the National Register of Historic Places (NRHP) database for Michigan as the best available recent data regarding architectural resources.

In addition to the site file search, SWCA investigated historic plat and topographic maps and historic aerial imagery of the Project Area and Study Area. SWCA also researched environmental factors such as modern and historic land use and soil units mapped by the Natural Resources Conservation Service (NRCS) to determine the likelihood of the project to encounter previously unrecorded precontact or postcontact archaeological resources.

4 RESULTS

4.1 Physiography, Geology, and Soils

The Project Area is situated within the Erie-Huron Lake Plain of the Eastern Lake section of the Central Lowland province of the Interior Plains (NRCS 2022:343). The Erie-Huron Lake Plain is a fairly level glacial lake plain with scattered sandy ridges formed by former shorelines and moraines. Elevation ranges from approximately 570 to 815 feet (175 to 250 meters [m]), whereas local relief averages 10 feet (3 m). Major confluences in the Erie-Huron Lake Plain include the Clinton, Huron, and Saginaw Rivers, which empty into the Great Lakes. The Project Area is located within the Floodwood Creek-River Raisin watershed and the Big Meadow Drain-Black Creek watershed, which empty into the River Raisin (U.S. Environmental Protection Agency 2023). Mississippian- to Silurian-age limestone, shale, and dolomite are common along the surface and along the shores of Lake Erie and Lake Huron. Broad, level, and somewhat poorly drained lake plains feature American beech, sugar maple, silver maple, green ash, pin oak, swamp white oak, and American elm, whereas sandy areas feature eastern white pine, eastern hemlock, and other coniferous trees (NRCS 2022:344).

This ecoregion is also part of the Maumee Lake Plain and the Ann Arbor Moraines sub-subsections. The Maumee Lake Plain is a broad, flat, glaciated clay lake plain with rich, loamy soils deeply mantled by till and outwash and dissected by broad glacial drainageways containing sandy soils (Albert 1995). This region formerly included beech-sugar maple forest, elm-ash forest, deciduous swamps, white oak-black oak savannas, wet prairies, and coastal marshes, but now has been largely cultivated (Albert 1995; NRCS 2022). The Ann Arbor Moraines sub-subsection is a long, narrow band of fine- and medium-textured end and ground moraine bordered by flat lake plain on the east and by sandy outwash, end moraine, and ice-contact features to the west. This region formerly supported oak and oak-hickory forests, with oak

savannas along the western edge (Albert 1995). Major wildlife species in the Erie-Huron Lake Plain area include white-tailed deer; cottontail rabbits; squirrels; raccoons; pheasants; bobwhite quail; songbirds; various species of snakes, frogs, and turtles; sunfish; perch; bass; walleye; catfish; carp, sucker; and northern pike.

There are 40 soil series mapped within the Project Area by the NRCS (Table 1). The soils range from very poorly drained to excessively drained loams to sandy loams. The most common soils for the Project Area include Brady and Macomb loams, 0 to 3 percent slopes; Colwood very fine sandy loam, 0 to 3 percent slopes; Wauseon loam, 0 to 3 percent slopes; Ziegenfuss clay loam, 0 to 1 percent slopes; Brady and Macomb sandy loams, 0 to 3 percent slopes; and Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes. These soil types, and their implication for site formation processes and archaeological potential, are discussed further in Section 4.6.

Table 1. Soils within the Project Area

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
BbA	Berrien loamy sand, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BbB	Berrien loamy sand, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcA	Berrien sandy loam, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcB	Berrien sandy loam, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BhA	Brady sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on strand plains	Loamy over sandy and gravelly glaciofluvial deposits
BkA	Brady and Macomb loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BnA	Bronson sandy loam, 0 to 3 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BnB	Bronson sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BoA	Brookston loam, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
CbB	Cadmus sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over loamy till
CeA	Colwood very fine sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CgA	Conover loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Loamy till
GbA	Genesee sandy loam, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
GcA	Genesee and Eel loams, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GgA	Griffin and Sloan loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Clayey till
KbC	Kendallville sandy loam, 7 to 15 percent slopes	Well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over till
KeA	Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on deltas	Stratified loamy glaciofluvial deposits
LcA	Linwood muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Wood organic material over loamy till
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Drainageways on till-floored lake plains	Sandy and/or loamy glaciofluvial deposits over loamy till
NaA	Nappanee silt loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Clayey till
NbB	Nappanee loam, 3 to 7 percent slopes	Somewhat poorly drained	Knolls on ground moraines	Clayey till
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	Somewhat poorly drained	Knolls on ground moraines	Clayey till
OcC	Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded	Excessively drained	Beaches on till-floored lake plains	Glaciofluvial deposits and/or sandy glaciolacustrine deposits over loamy till
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	Poorly drained	Depressions on till plains	Loamy till
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PdB	Plainfield and Berrien loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PeB	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PwmaaA	Pewamo clay loam, dense substratum, 0 to 1 percent slopes	Poorly drained	Drainageways on nearshore zones (relict), flats on nearshore zones (relict)	Clayey till over dense till
RbA	Rollin muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Herbaceous organic material over marl
SbA	Sebewa sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on glacial drainage channels	Loamy over sandy and gravelly glaciofluvial deposits
Sf	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	Poorly drained	Drainageways on stream terraces, drainageways	Loamy drift over sandy and gravelly outwash
WcA	Wauseon loam, 0 to 3 percent slopes	Poorly drained	Depressions on till-floored lake plains	Glaciolacustrine deposits over clayey till

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	Poorly drained	Wave-worked till plains	Clayey till over loamy till
W	Water	N/A	N/A	N/A

Source: NRCS (2024).

4.2 Historical Land Use

SWCA reviewed historic plat and topographic maps, as these sources provide information on past land use within the Project Area and Study Area that may indicate the probability of encountering significant precontact and postcontact cultural resources in or near the Project Area. The historic maps indicate that there has been a general consistency in the road network and land-use patterns from the late nineteenth century into the modern era in the Study Area.

The earliest available map of the Project Area is an 1819 General Land Office survey map (Bureau of Land Management General Land Office 2024). The Project Area is uninhabited. The River Raisin is drawn as a winding water course east of the Project Area. There are patches of marshlands, and tributaries are marked but not fully drawn. No structures are depicted. Palmyra and Lenawee Junction have not yet been established.

The first available plat map, dated 1874, shows that the Project Area and Study Area had been divided into large landholdings. Residences, schools, and churches are depicted. Roads and three railroads also are in place, including the Lenawee County Railroad and Palmyra Road. The current U.S. Highway 233 is shown as a railroad. Several structures are depicted on landholdings within the Project Area. Some of these structures are adjacent to orchards or small agricultural fields. There are branches of unnamed tributaries flowing throughout the Project Area, one of which is the modern Big Meadow Drain (Everts and Stewart 1874).

By 1893, the Project Area is depicted similarly to the 1874 plat. More landowners have appeared, represented by smaller landholdings, and structures are depicted within the Project Area. The unnamed tributaries are still depicted, running through the central and southern portions of the Project Area (Cadwell 1893).

The 1916 plat map shows an increase in landowners once more as the communities of Lenawee Junction and Palmyra continue to grow. Structures also are depicted on these parcels in the Project Area and are shown mostly along roads. U.S. Highway 233 is depicted as the Toledo Western electric railroad. There is another railroad that runs north-south to the Toledo Western electric railroad, connecting from Adrian to Palmyra within the Project Area. This segment of rail had been a road on the 1874 and 1893 plat maps. Several tributaries also are shown within the Project Area (Ogle 1916).

The 1921 plat map does not show individual structures beyond churches and schools, neither of which are in the Project Area. Landowner names are given, and the road network and railroads appear in the same location as on previous plats (*Adrian Daily Telegram* 1921). The 1928 plat presents the same information (*Adrian Daily Telegram* 1928).

SWCA also reviewed historic topographic maps to determine the land use of the Project Area and Study Area. Four historic topographic maps from 1939 to 1972 show that there has been little development from the early twentieth century to the present (U.S. Geological Survey [USGS] 2024). On the earliest available topographic map (Blissfield, Michigan, 1939, 1958 edition), multiple structures are shown in the

Project Area along roadways. The tributaries shown on the plat maps are named and shown: Big Meadow Drain, Bixby Drain, and Grinnell Drain. The road network and railroads are also depicted. The 1941 Blissfield, Michigan, topographic map reveals a similar image. The 1972 Palmyra, Michigan, and 1972 Tecumseh South, Michigan, topographic quadrangles name most of the roads in the Project Area, and they show that residential development had not increased outside of Palmyra and Adrian. Transmission and telecommunication cables are also depicted (USGS 2024).

A review of 17 aerial photographs taken between 1955 and 2022 indicates that minimal land development occurred within the Project Area and its environs. On the aerial images beginning in 1955, the landscape is agricultural. Isolated farmsteads are visible along roadways outside of Palmyra, Lenawee Junction, and Adrian. Drainages are visible either as scars on the landscape or are lined with trees, as is the River Raisin. There are some stands of trees throughout the Project Area. Between 1955 and 2022, no noticeable changes occur to the land use in the Project Area or Study Area (Historic Aerials 2024).

4.3 Previous Cultural Resources Surveys

A review of MI SHPO records identified one cultural resources survey that was conducted in the Project Area and two cultural resources surveys conducted within the Study Area (Table 2). Project ER00-7.17.161134 was a reconnaissance investigation conducted in 2017 by Archaeological Consultants of Ossian. The survey area covered 0.44 acre of land, and no cultural resources were identified during the survey (Stillwell 2017). Project ER17-391 was conducted for the Howard Street/West Michigan CMAQ and Rehabilitation project; however, the MI SHPO records did not contain information on the surveyors, year, or report title. Project B17-258, identified on quad maps in the MI SHPO research repository as Lauterbur 2016, was a Phase I archaeological survey conducted in support of the replacement of the River Raisin Bridge in Palmyra, Michigan. The MI SHPO records did not include information on the extent of the survey; however, no archaeological sites were identified during the survey.

Table 2. Previous Cultural Resources Surveys in the Study Area

Project ID	Project Name	Survey Year	Surveyors	Report Title	Location
ER00-7.17.161134	G2 Cellular Tower Site Review #161134	2017	Archaeological Consultants of Ossian	*An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project #161134) in Palmyra, Lenawee Conty, Michigan. 17FR29Mi.*	Project Area
ER17-391	Howard Street/ West Michigan CMAQ and Rehabilitation	None recorded	None recorded	None recorded	Study Area
B17-258	Lauterbur 2016	2016	Michigan Department of Transportation	*Archaeological Investigations at US-223 River Raisin Bridge Replacement, Palmyra, Lenawee County.*	Study Area

4.4 Previously Recorded Archaeological Sites

[redacted]

[redacted]

4.5 Previously Recorded Architectural Resources and Cemeteries

SWCA reviewed the National Park Service's NRHP database for Lenawee County, Michigan, regarding information on historic districts, buildings, archaeological sites, and other properties eligible for or listed in the NRHP. The NRHP database did not identify any NRHP-listed resources within the Project Area (National Park Service 2024).

SWCA also reviewed historic architecture data provided by the MI SHPO in April 2023. No previously recorded architectural resources are located within the Project Area; three architectural resources are located in the Study Area (Table 4; Appendix A: Figure 5).

No recorded cemeteries are present in the Project Area; two postcontact cemeteries (Palmyra Village Cemetery and Crane Cemetery) are located within the Study Area (Table 5; Appendix A: Figure 5). Palmyra Village Cemetery was included in the MI SHPO site file data, while Crane Cemetery was identified through archival research of historic topographic maps. Due to the data gap in the MI SHPO site file records since February 2024, it is not clear if Crane Cemetery is still absent from MI SHPO site file records.

Table 4. Previously Recorded Historic Architectural Resources in the Study Area

Site ID	Historic Name	City	NRHP Status	Location
P23943	Palmyra Presbyterian Church	Palmyra	Unevaluated	Study Area
P61449	Bruce Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area
P61451	Scott Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area

Table 5. Previously Recorded Cemeteries in the Study Area

Historic Name	Record Source	Location
Palmyra Village Cemetery	MI SHPO site file data	Study Area
Crane Cemetery	Archival research	Study Area

4.6 Geoarchaeology

Geoarchaeology, which is a multidisciplinary field that incorporates topography, geomorphology, geology, and soils, helps archaeologists to understand how geological processes have influenced the preservation of archaeological sites. Research conducted by Monaghan and Lovis (2005) demonstrates that deeply buried soils have an increased probability of sustaining cultural resources where fluvial deposits overlie alluvial deposits as a result of waterways breaching their banks. Monaghan and Lovis developed a predictive geoarchaeological model that takes these effects into account and classifies an area's likelihood of having cultural resources from Low to High-Very High.

Based on the Monaghan and Lovis (2005) model, the Project Area intersects with areas modeled as having moderate to high potential for deeply buried archaeological deposits (Figure A-6). [redacted] Otherwise, the remainder of the Project Area is largely mapped as exhibiting a low potential for deeply buried archaeological deposits.

[redacted]

4.7 Cultural Resources Context and Potential

The potential of the Project Area to contain cultural resources was developed through examination of the natural and topographical characteristics of the Project Area and available historic-era maps and aerial photographs.

4.7.1 Potential for Precontact Archaeological Sites

[redacted]

4.7.2 Potential for Postcontact Archaeological Sites

[redacted]

5 SUMMARY AND RECOMMENDATIONS

In summary, the records review established that one cultural resources survey has been conducted previously within the Project Area, and two cultural resources surveys have been conducted in the Study Area. These compliance surveys were negative and did not result in the recordation of cultural resources within the Project Area or the Study Area. However, [redacted] None of the archaeological sites within the Project Area have been evaluated for listing in the NRHP. There are no previously recorded architectural resources within the Project Area and three architectural resources in the Study Area. Based on MI SHPO records and a review of the NRHP, there are no NRHP-listed resources located within the Project Area or Study Area.

There is an overall moderate probability for significant precontact archaeological sites and a low to moderate probability for significant postcontact archaeological sites within the Project Area. [redacted]

Should the project require archaeological survey, the geoarchaeological modeling (Monaghan and Lovis 2005) suggests that shovel testing and/or deep testing (e.g., auguring) may be necessary [redacted] Pedestrian survey is a viable survey methodology as long as alluvial soils are confined to the plow zone (e.g., 12 inches [30 centimeters]); the limits of shovel testing is typically 3 feet (1 m).

Based on the MPSC regulations and our communications with the MI SHPO (personal communication, Sarah Surface-Evans and Scott Slagor, January 30, 2025), SWCA recommends initiating consultation with the MI SHPO. SWCA understands that MI SHPO has initiated a new consultation process for projects subject to permitting through the MPSC, and that the MI SHPO will provide expert testimony regarding cultural resources to the MPSC. To initiate the consultation process, the MI SHPO requests developers to complete a consultation application, in coordination with a professional archaeologist and architectural historian, The MI SHPO will provide their recommendations for next steps, including survey and avoidance requirements. SWCA understands that RWE will have 1 year after submittal of the MPSC permit application to obtain the approval of survey reports or recommendations submitted to the SHPO.

In keeping with Public Act 233, which requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC, SWCA recommends this document be provided to the MPSC for review. Approval from the MPSC is required before development within the boundaries of these sites occurs.

6 REFERENCES CITED

Adrian Daily Telegram. 1921. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21190/Palmyra+Township/Lenawee+County+1921/Michigan/. Accessed November 14, 2024.

———. 1928. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/1610467/Palmyra+Township++Raisin+River/. Accessed November 14, 2024.

Albert, Dennis A. 1995. Regional landscape ecosystems of Michigan, Minnesota and Wisconsin: A working map and classification. General Technical Report NC-178. U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota. Available at: https://www.nrs.fs.usda.gov/pubs/gtr/other/gtr-nc178/index.html. Accessed November 1, 2024.

Bureau of Land Management General Land Office. 2024. Original Survey Plat, Township 7 North, Range 4 East, 3rd Principal Meridian. Available at: https://glorecords.blm.gov/details/survey/default.aspx?dm_id=27676&sid=usa5y3jo.a4o#surveyDetailsTabIndex=0. Accessed November 14, 2024.

Cadwell, George D. 1893. Atlas of Lenawee County, Michigan. Geo. D. Cadwell and Company, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21077/Palmyra+Township/Lenawee+County+1893/Michigan/. Accessed November 14, 2024.

Everts and Stewart. 1874. Combination Atlas Map of Lenawee County, Michigan. Everts and Stewart, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/20906/Palmyra+Township/. Accessed November 14, 2024.

Historic Aerials. 2024. Historic Aerials Viewer. Available at: https://www.historicaerials.com/viewer. Accessed November 14, 2024.

Monaghan, G. William, and William A. Lovis. 2005. *Modeling Archaeological Site Burial in Southern Michigan: A Geoarchaeological Synthesis*. Michigan State University Press, East Lansing.

National Park Service. 2024. National Register of Historic Places Database and Research. Available at: https://www.nps.gov/subjects/nationalregister/database-research.htm. Accessed January 13, 2025.

Natural Resources Conservation Service (NRCS). 2022. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. Washington, D.C.

———. 2024. Custom Soil Report. Available at: http://websoilsurvey.nrcs.usda.gov. Accessed December 12, 2024.

Ogle, George A. 1916. Standards Atlas of Lenawee County, Michigan. Geo. A. Ogle Publishers and Engravers, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/22243/Palmyra+Township/Lenawee+County+1916/Michigan/. Accessed November 14, 2024.

Stillwell, Larry N. 2017. *An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project No. 161134) in Palmyra, Lenawee County, Michigan*. Archaeological Consultants of Ossian. On file at the Michigan State Historic Preservation Office, Lansing, Michigan.

U.S. Environmental Protection Agency. 2023. How's My Waterway Viewer. Available at: https://mywaterway.epa.gov/. Accessed November 14, 2024.

U.S. Geological Survey (USGS). 2024. National Geologic Map Database Project TopoView. Available at: https://ngmdb.usgs.gov/topoview/viewer/#14/41.8731/-83.9695. Accessed November 14, 2024.

APPENDIX A

Figures

Figure A-1. Location of the proposed Rouget Road, LLC Area in Michigan.

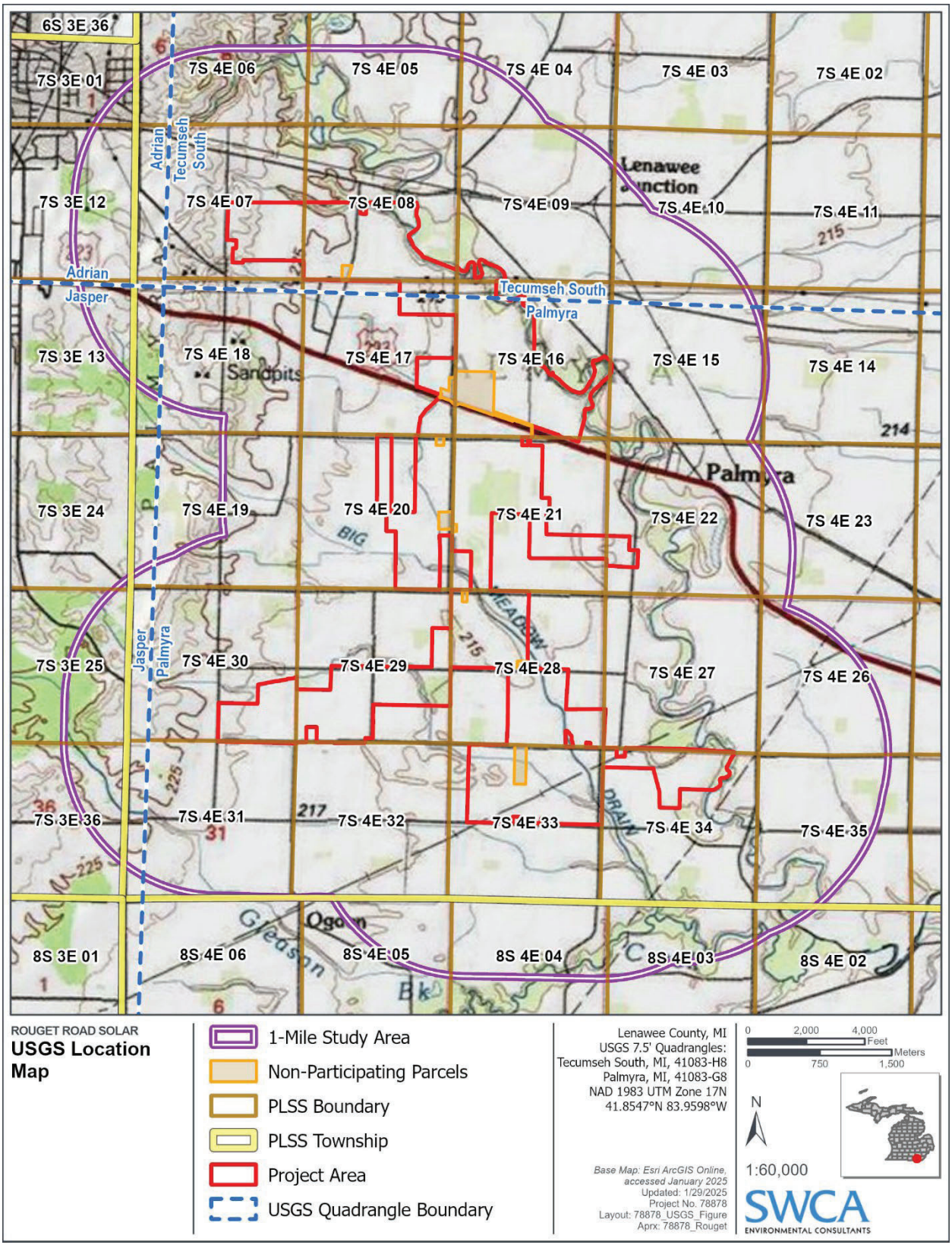

Figure A-2. Location of the Study Area for the proposed Rouget Road, LLC on a USGS topographic map.

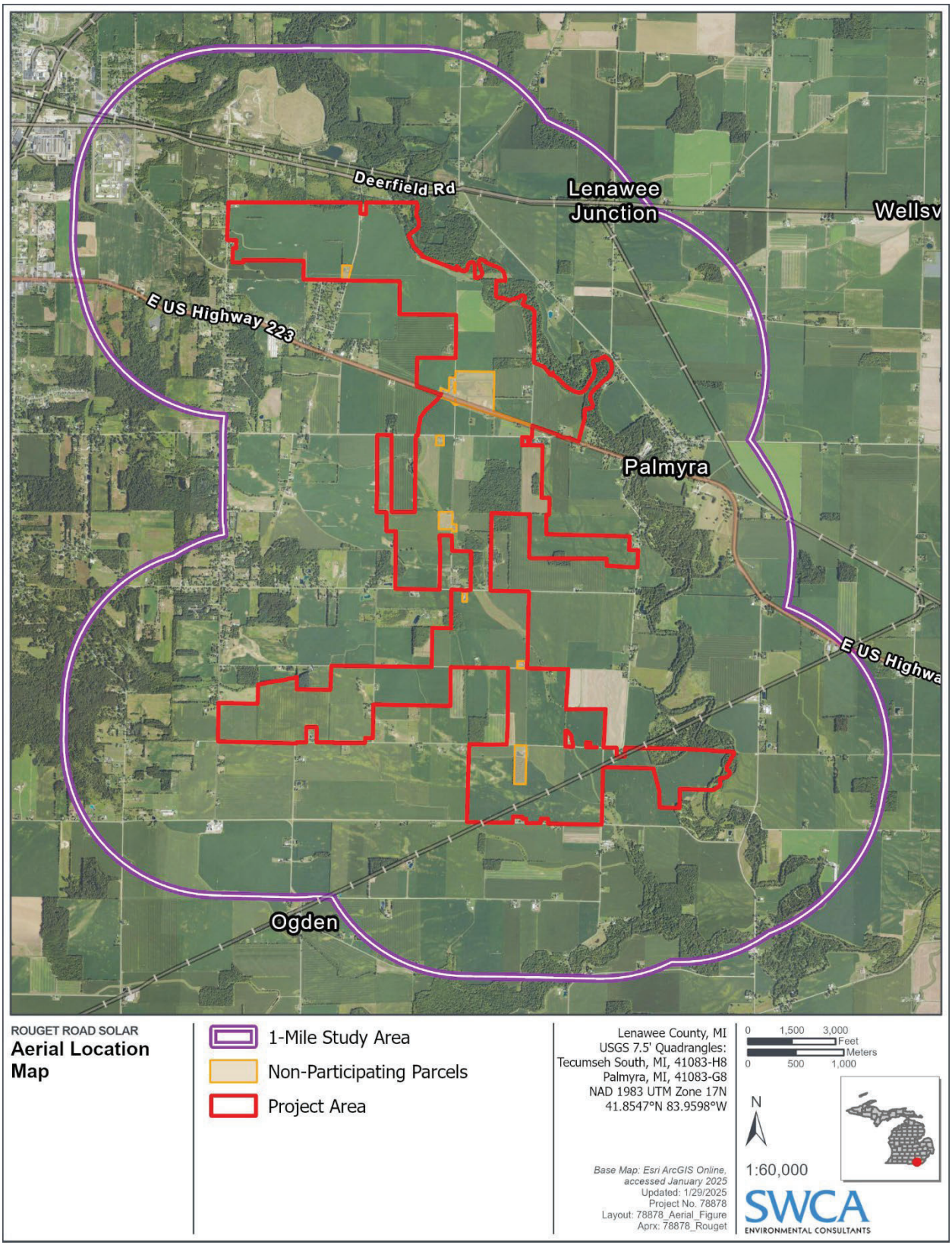

Figure A-3. Overview of the Study Area for the proposed Rouget Road, LLC on aerial imagery.

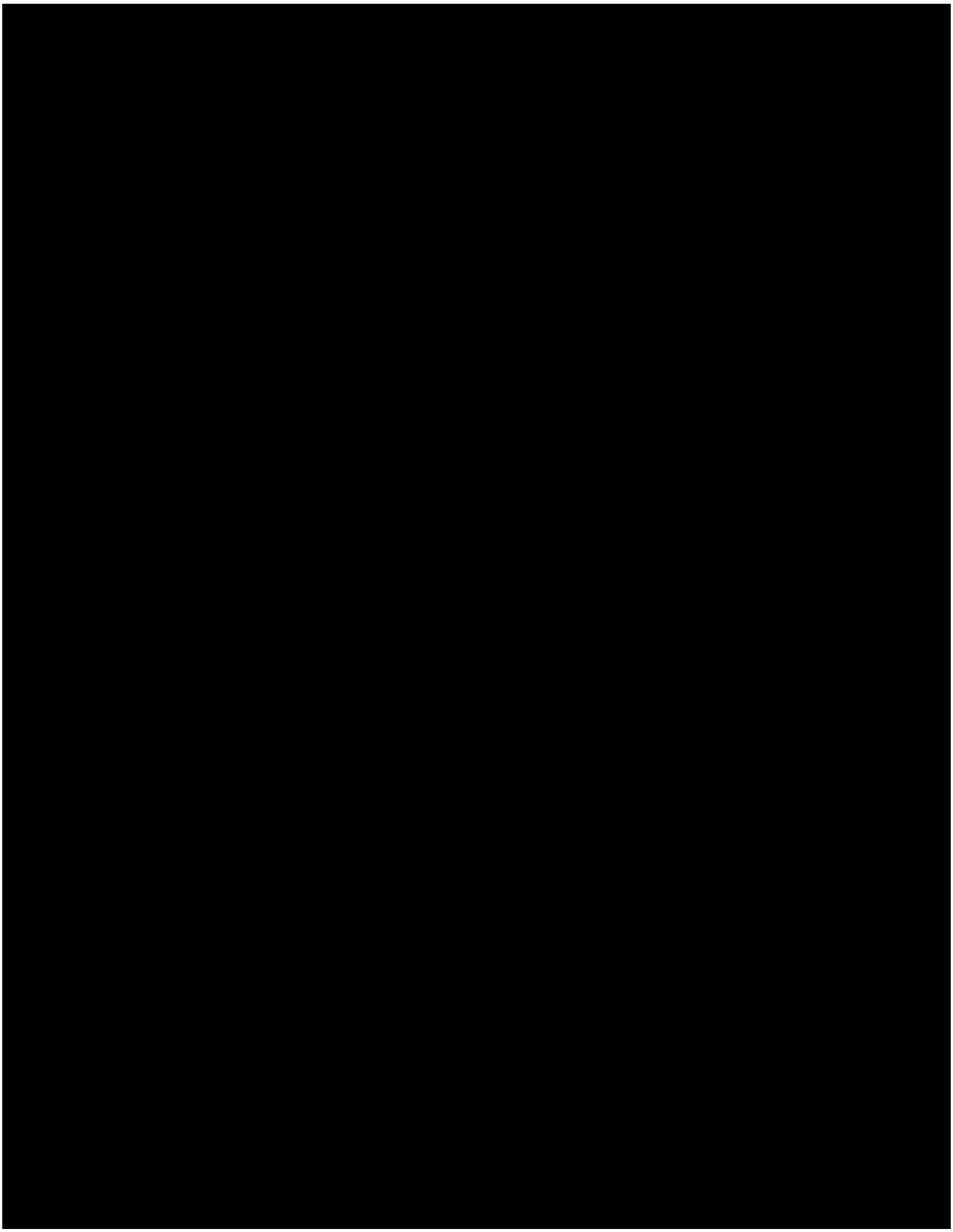

Figure A-4. Results of the background research for previously recorded cultural resources and previously conducted surveys.

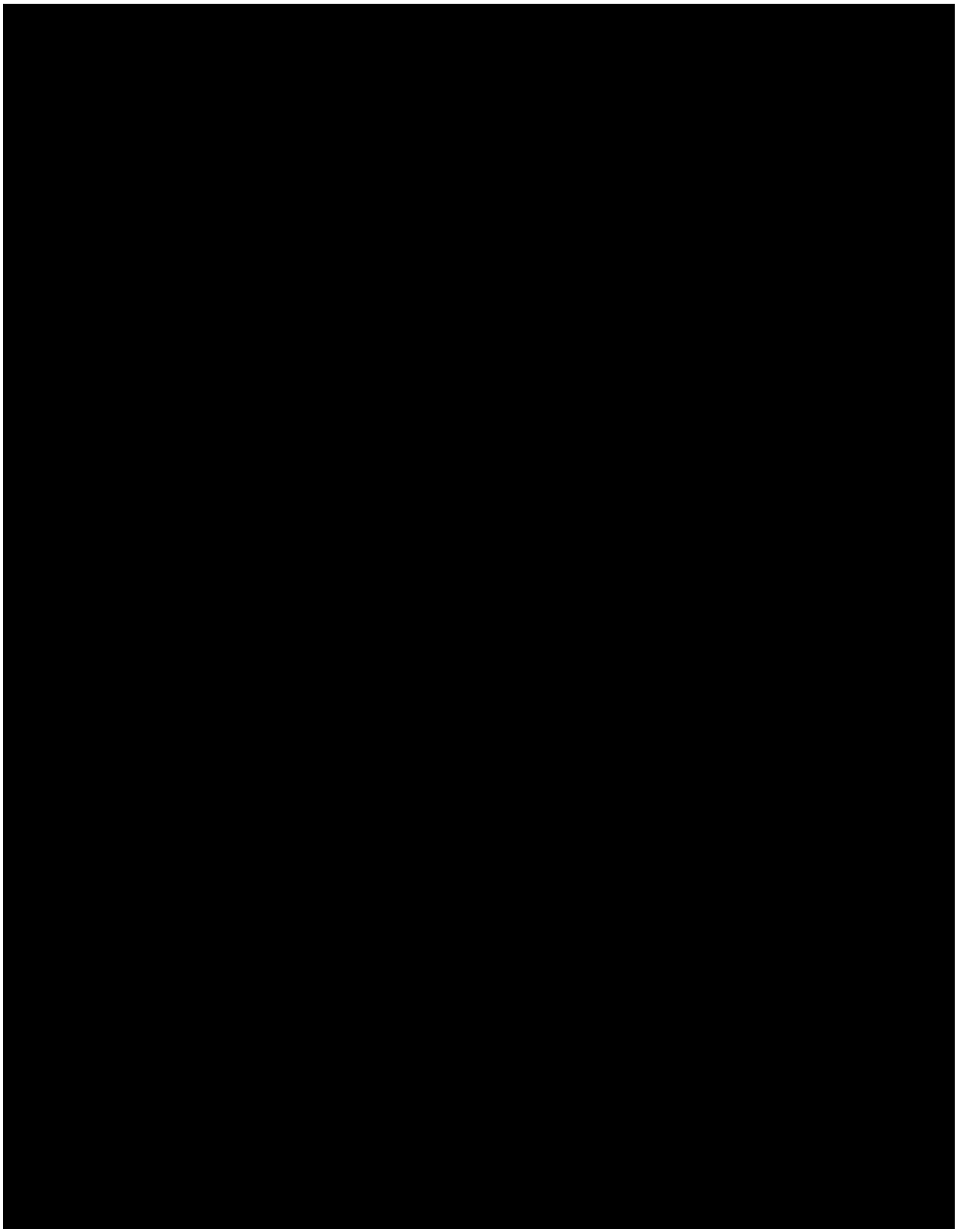

Figure A-5. Results of the background research for postcontact architectural resources and cemeteries.

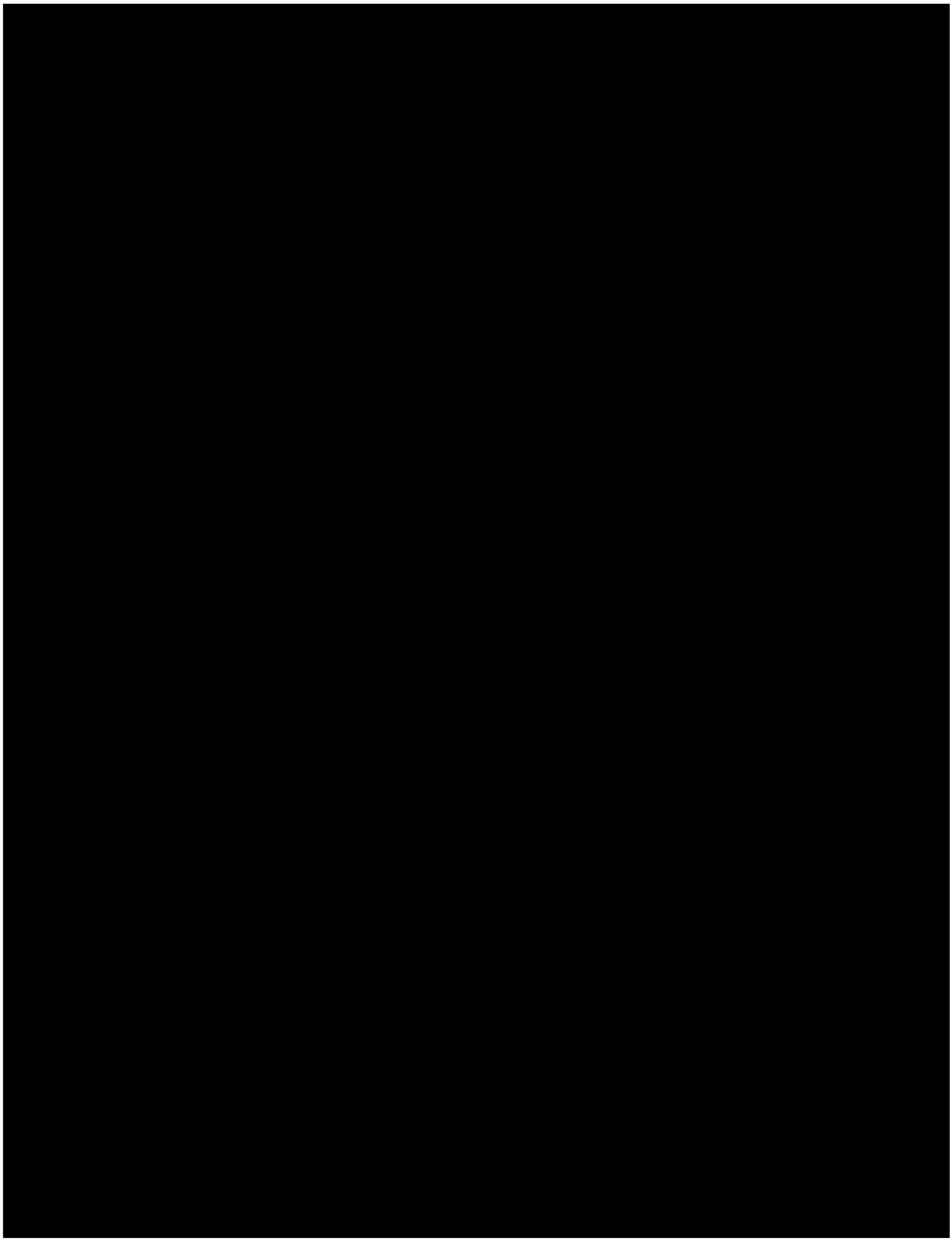

Figure A-6. Areas modeled as having moderate to high potential for deeply buried archaeological deposits in the Project Area and Study Area.

GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
MICHIGAN STRATEGIC FUND
STATE HISTORIC PRESERVATION OFFICE

QUENTIN L. MESSER, JR.
PRESIDENT

September 10, 2025

KEVIN COLE
ROUGET ROAD LLC
10250 PENLAWN DR.
JEROME, MI 49249

RE: SR25-23 PA233 Review Rouget Road, LLC Solar, T07S/R04E/Sec. 7, 8, 9, 15, 16, 17, 20 ,21, 22, 27, 28, 29, 30, 33, and 34, Palmyra Township, Lenawee County (MPSC)

Dear Mr. Cole:

We have received your request for review of the above-cited project under Public Act 233 of 2023 for Renewable Energy and Energy Storage Facility Siting (PA 233) at the above-noted location. We have reviewed the assessment prepared by SWCA, "Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan" and appreciate the information provided. To fully consider and address impacts to cultural and historic sites we require additional information, please send the following:

General

In the materials submitted, the project area boundaries in the submission form and in the Desktop Review do not match. Please ensure that we have the final project boundary maps included in all materials submitted to our office. Desktop Review states that the project plan will avoid archaeological sites, however, the project mapping provided does not make this apparent or clear. We cannot assess the impact of the proposed project on historic resources without accurate mapping information. Additionally, we would like to see the locations of staging areas, vehicle traffic, and any other areas that may have ground disturbance mapped.

Archaeological Resources

Due to the presence of previously documented sites within and near the project area, and the high archaeological sensitivity for the River Raisin valley generally, SHPO requests full archaeological survey for the entire project area, including staging areas. In particular, the boundaries of site 20LE28 are poorly delineated. In order to avoid this site, which is known to contain burials, additional survey methodologies may be necessary beyond pedestrian survey or shovel testing***. SHPO recommends consulting with our office and Tribal Nations with historic connections to this region to develop an appropriate methodology***, which may include geophysical prospection or historic human remains detection dog (HRD) survey. SHPO also recommends developing an Unanticipated Discovery Plan (UDP) for the project. A UDP specifies who will be contacted and what measures will be taken in the event of an unanticipated discovery of archaeological materials or human remains during the project implementation. Please see the UDP template attached, for an example of how these documents are organized. SHPO encourages the project proponent to work with consulting party tribes to develop an

appropriate UDP and protocol for handling human remains.

Above-ground Resources

SHPO concurs with the proposed methodology of utilizing the Above Ground Table in lieu of identification forms except that we require identification forms for properties that are identified as eligible. The table does not provide enough information for eligible properties. For eligible properties, photographs of all resources must also be included in an attachment with Architectural Properties Identification Form. When discussing effects to above-ground resources, please be sure to provide discussion of visual impacts as well as visual barriers in place that may play in to effects determinations. Also be sure that the Historic Resource Survey Report contains enough history and contextual information about the area and resources for SHPO to adequately assess eligibility.

Additional information must be submitted online through our Additional Information Portal.

Please note that our review cannot proceed until we are able to consider the information requested above. This letter is not concurrence. If you have any questions, please contact please contact Senior Archaeologist, Sarah Surface-Evans, surfaceevanss1@michigan.gov, (517) 282-7959 or Historian, Katlyn Burns Yancho, at 517-256-3416, burnsyanchok@michigan.gov. **Please reference our project number in all communication with this office regarding this review.** Thank you for your consultation.

Sincerely,

Sarah Surface-Evans, PhD, RPA
Senior Archaeologist

SES:KAK:KBY:SSE

Enclosure(s): UDP Template

Copy: Anna Gilmer, SWCA

Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan

From:	Jonathan Libbon
To:	"Lakota.Hobia@glt-nsn.gov"; "Mbpi_thpo@glt-nsn.gov"
Cc:	Carol Mcknight; Aleyda Galan; Cole, J Kevin; Quarles, Mark; Anna Gilmer
Subject:	Rouget Road Solar Consultation Letter
Date:	Thursday, November 20, 2025 5:01:00 PM
Attachments:	Rouget Tribal Consulation LTR_20Nov2025.pdf image001.png
Sensitivity:	Private

Good Afternoon Lakota,

On behalf of Rouget Road Solar Farm LLC, a wholly-owned subsidiary of RWE Clean Energy LLC (RWE), we are reaching out to request your input on the Rouget Road Solar Farm Project, a proposed solar facility in Lenawee County, Michigan. The facility will require a state siting certificate from the Michigan Public Service Commission (MPSC). The attached letter and documentation outline the project and provide details on the cultural resource work completed to date. We are seeking comments from your area of expertise regarding any potential environmental or cultural effects associated with this project.

Please let me or Kevin Cole (cc'd), the project manager from RWE, know if you have any questions about the project.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

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11/20/2025

Dear Tribal Historic Preservation Officer and/or Tribal Cultural Representative,

As part of its responsibilities under Michigan Public Act 233 of 2023 (PA 233), *Renewable Energy and Energy Storage Facility Siting*, the Michigan Public Service Commission (MPSC) is seeking consultation (as required in PA 233 Section 224.1b[1]) and determining the area of potential effects ("APE") for the proposed project. Federally listed sovereign Nations with an interest in the state of Michigan are invited to review and comment on Rouget Road Solar Farm, LLC's (Rouget Road Solar Farm) (a wholly-owned subsidiary of RWE Clean Energy LLC [RWE]) proposed **Rouget Road Solar Farm Project** (the "Project"). The proposed Project will require a state-siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC (PA 233 Section 226.7b). Although Rouget Road Solar Farm requests a review and comment on the Project, the MPSC is the state agency and may be communicated with directly.

Based on Michigan State Historic Preservation Office (MI SHPO) guidance from their *Instructions for the Application for PA 233 Renewable Energy Storage Facility Siting Consultation Form*:

> "**Public Act 233** requires the applicant for energy siting and storage facilities to consider and address impacts *to the environment and natural resources, including, but not limited to, sensitive habitats and waterways, wetlands and floodplains, wildlife corridors, parks,* ***historic and cultural sites****, and threatened or endangered species*. The applicant must submit this information to the Michigan Public Service Commission (MPSC) for consideration in permitting the project. In order to facilitate considerations of historic and cultural sites (hereafter Historic Properties), the MPSC has required applicants to consult with the State Historic Preservation Office (SHPO)."

This letter is part of the early coordination phase of the environmental review process, requesting comments associated with this Project. We are requesting comments from your area of expertise regarding any possible environmental or cultural effects associated with this Project. Please provide any additional information you may have regarding potential cultural resources in the Project area so they may be accounted for during the environmental review of this Project. This information can be provided directly to RWE or the MPSC.

Project Description

The proposed Project is southeast of the city of Adrian, in Palmyra Township, Lenawee County, Michigan (Figure 1). Historic Mapping places the proposed Project area in Sections 7, 8, 9, 15, 16, 17, 20, 21, 22, 27, 28, 29, 30, 33, and 34 of Township 7 South, Range 4 East as seen on the enclosed USGS 7.5 series for Tecumseh South and Palmyra, Michigan Topographic Quadrangle map (Figure 2). Rouget Road Solar Farm is proposing to construct a 175-megawatt (MW) alternating current (AC) solar photovoltaic power generating facility. The leased area/Project area boundary includes approximately 2,142 acres (867 hectares) (Figures 2 and 3). Construction will require 1,513 acres (612 ha) of what is currently primarily agricultural land (see site plan boundary in Figure 1). Limited tree removal is planned across 7.96 acres (3.22 ha). Proposed work required for the Project includes construction of a switchyard, substations, access

[1] Sections refer to those found at: https://www.legislature.mi.gov/documents/2023-2024/publicact/htm/2023-PA-0233.htm

roads, fencing, MV electrical cabling, and solar panel structures. Construction may also include an operations and maintenance building.

Project Permitting
The proposed Project will require a siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC.

PA 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 MW or more, to wind projects with a capacity of 100 MW or more, and energy storage facilities with a capacity of 50 MW or more. Projects that fall into these categories must identify and provide information on the effects of the Project on environmental, natural, and cultural resources. Additional PA 233 information is available online at State Project Reviews | MiPlace[2], and a Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the MPSC is available online at Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the Michigan Public Service Commission. [3]

Cultural Resource Investigations
The APE is the area in which the proposed Project may cause alterations in the character or use of historic resources. As the site plan boundary includes all locations that may be impacted by ground disturbing activities related to the project undertaking, it is considered the physical APE (see Figure 1). The visual APE for assessing visual effects to historic-age resources is a 0.5-mile buffer from the boundaries of the Project area (e.g., leased area/project boundary) (see Figure 2). This boundary will be modified based on visual intrusions that may obscure the project.

Rouget Road Solar Farm has contracted SWCA Environmental Consultants (SWCA) to conduct the archaeological and architectural history surveys. Due to the presence of previously--documented archaeology sites in and near the Project area, and the archaeological sensitivity for the River Raisin Valley, SWCA will conduct a full archaeological survey for the physical APE, including staging areas. The boundaries of [redacted], is mapped as lying within the proposed Project area; however, these site boundaries are mapped based off archival records and the extent of the complex is poorly understood. In order to be sensitive toward this [redacted], we are asking for your input on the extent of the complex and the survey methodologies that may be necessary beyond [redacted] An Unanticipated Discoveries Plan (Exhibit A-1.14 in the MPSC permit application) has been prepared.

Summary of Requested Action
We look forward to consulting with your office on this Project and to a continued dialogue. We ask that you provide any comments regarding the Project area following your review of the enclosure. Please use the above Project name and Project description in your reply.

In summary, the MPSC and Rouget Road Solar Farm are requesting Tribal Governments to:

[2] https://www.miplace.org/historic-preservation/programs-and-services/cultural-resource-management-and-planning/state-project-reviews/

[3] https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/consumer/MPSC_Tribal_Involvement_Guide.pdf?rev=399582a67fbe46e883e6f21d1325e785&hash=AA471378E81539AFBBA758AB04FB3D25

1. Review the Project information.
2. Identify cultural or environmental concerns.
3. Provide feedback on archaeological methodologies (especially near site 20LE28).
4. Ensure that any cultural resources are addressed in the MPSC permitting process.

All comments will be documented and considered in Project design and the forthcoming MPSC state siting process. Consultation with SHPO and the THPOs included in the distribution list below will be incorporated into the cultural survey plan, recordation, and design updates as needed. Your timely response will greatly help us incorporate your concerns into the development of the Project. For that purpose, we request that you provide comments by December 20, 2025.

Tribal consulting parties may respond to myself (Kevin Cole) at rougetroadsola@rwe.com with any comments or concerns. Alternatively, you can reach out directly to Gustavo Cordero at the MPSC at corderog@michigan.gov.

Respectfully,

Kevin Cole
RWE Development Manager
rougetroadsola@rwe.com

cc: Gustavo Cordero, Michigan Public Service Commission
Carol McKnight, SWCA Environmental Consultants
Anna Gilmer, SWCA Environmental Consultants

Distribution List:
Forest County Potawatomi Community, Wisconsin
Hannahville Indian Community, Michigan
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
Little Traverse Bay Bands of Odawa Indians, Michigan
Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan
Menominee Indian Tribe of Wisconsin
Miami Tribe of Oklahoma
Pokagon Band of Potawatomi Indians, Michigan and Indiana
Sault Ste. Marie Tribe of Chippewa Indians, Michigan
Seneca-Cayuga Nation

Enclosures:
1. Figures
    a. Figure 1: State location map
    b. Figure 2: Portions of the USGS 7.5' series Tecumseh South and Palmyra Michigan Topographic Quadrangles showing the Project area.
    c. Figure 3: Aerial view of the Project area location in Palmyra Township, Lenawee County, Michigan.
2. Cultural Desktop Report
3. SHPO PA233 Response

Figure 1. Location of the proposed Rouget Road Solar Project Area in Michigan.

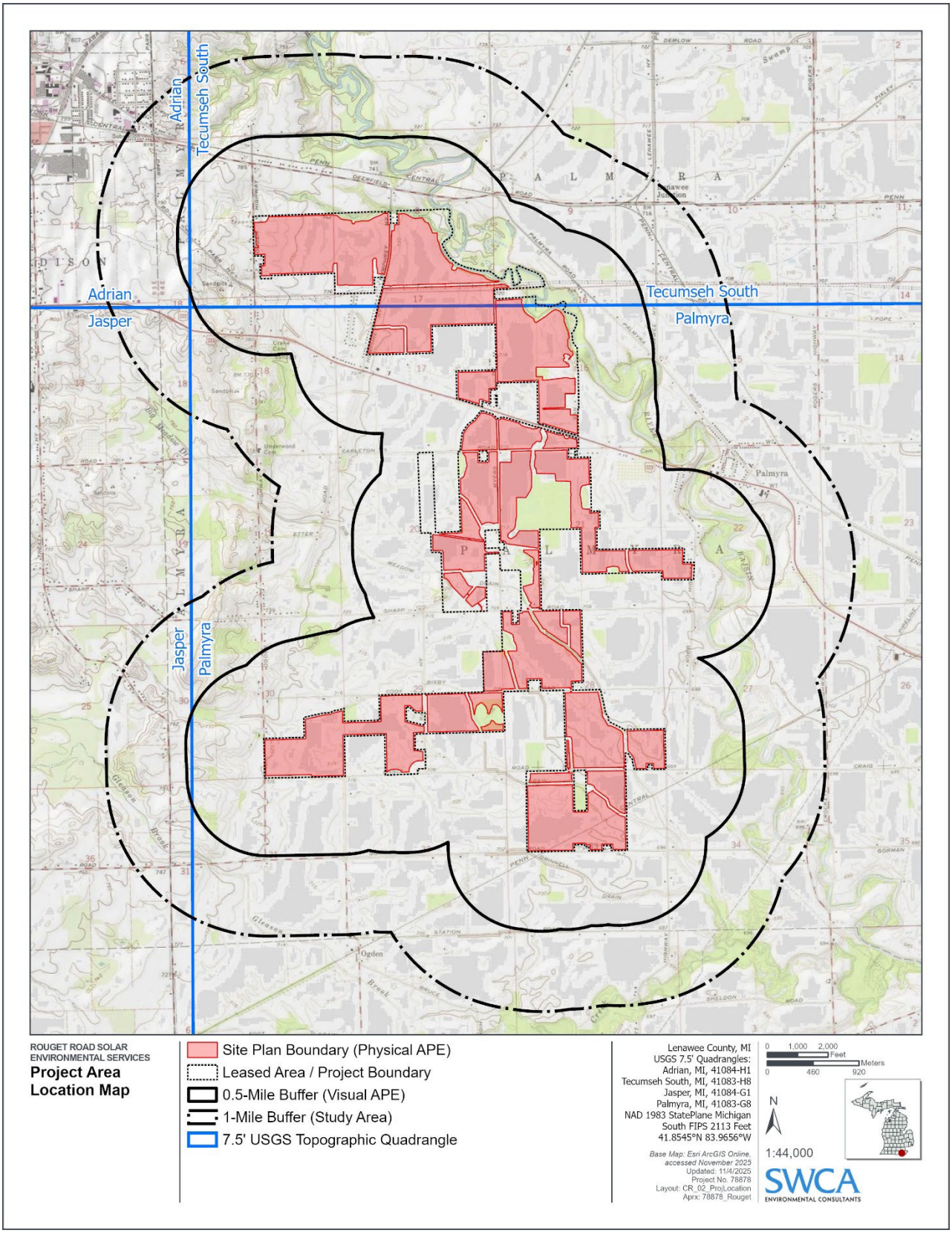

Figure 2. Portions of the USGS 7.5' series Tecumseh South and Palmyra, Michigan Topographic Quadrangles showing the site plan boundary and leased area/Project boundary.

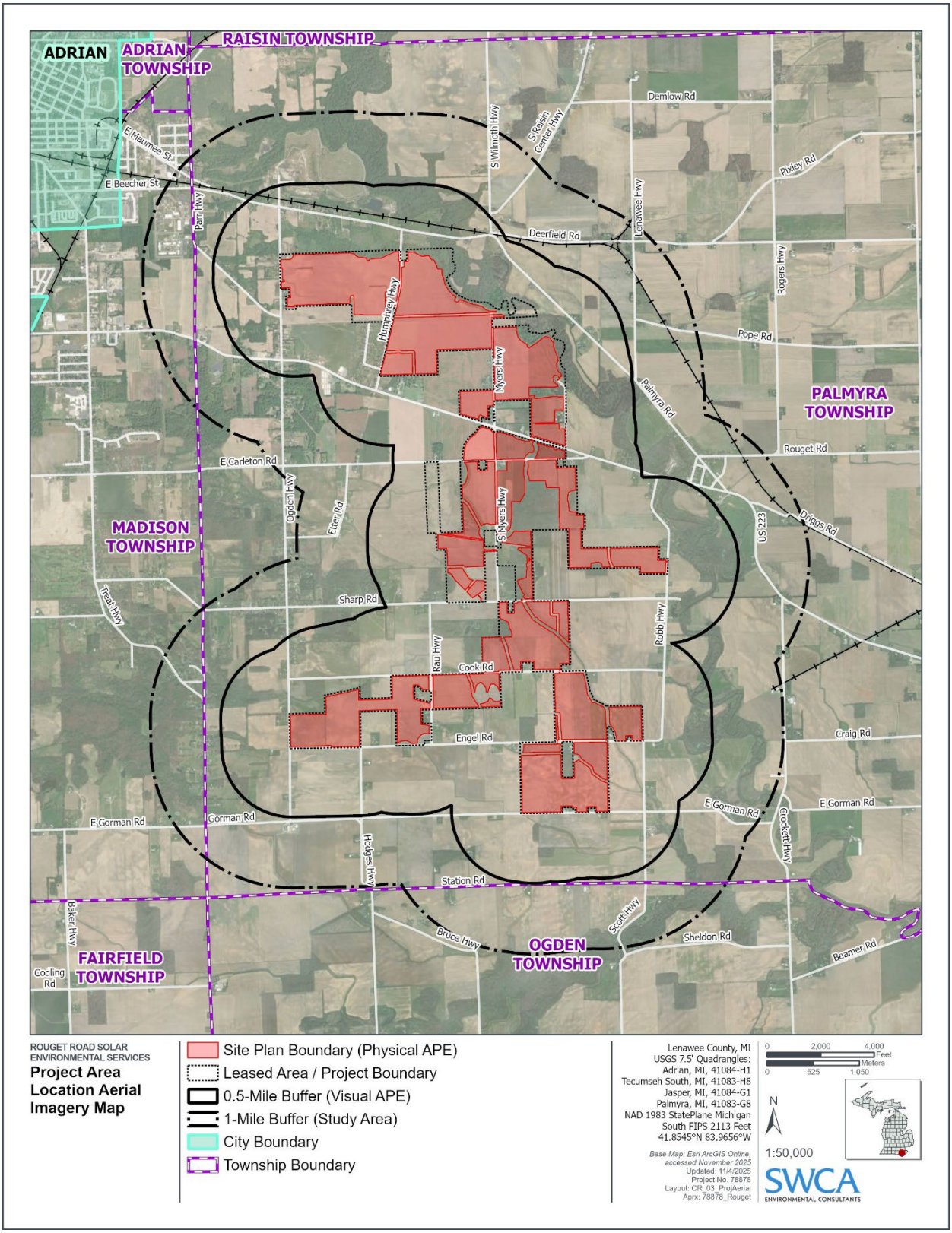

Figure 3. Aerial view showing the site plan boundary and leased area/Project boundary in Palmyra Township, Lenawee County, Michigan.

Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan

JANUARY 2025

PREPARED FOR

Rouget Road, LLC

PREPARED BY

SWCA Environmental Consultants

CULTURAL RESOURCES DESKTOP REVIEW FOR THE ROUGET ROAD, LLC LENAWEE COUNTY, MICHIGAN

Prepared for

Rouget Road, LLC
353 North Clark Street, 30th Floor
Chicago, Illinois 60654
Attn: J Kevin Cole

Prepared by

Rachel Lawrence, M.A., RPA
Heather MacIsaac, B.A.

and

Anna Gilmer, M.A., RPA

SWCA Environmental Consultants
200 22nd Street, Suite 220
Lombard, Illinois 60148
(630) 705-1762
www.swca.com

SWCA Project No. 78878

SWCA Cultural Resources Report No. 25-27

January 2025

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1 INTRODUCTION

SWCA Environmental Consultants (SWCA) completed a cultural resources desktop review for the proposed Rouget Road, LLC (project), located in Lenawee County, Michigan (Figure A-1 in Appendix A). The Project Area spans approximately 2,490 acres (1,008 hectares) of privately owned land near the towns of Adrian, Palmyra, and Ogden. SWCA completed the desktop review for the Project Area plus a surrounding 1.0-mile (1.6-kilometer) buffer around the Project Area. The surrounding 1.0-mile buffer is henceforth referred to as the Study Area (Figures A-2 and A-3).

The objective of the desktop review was to identify existing cultural resources within the Project Area and Study Area to inform project facility siting. Additionally, the Study Area was evaluated to gain an understanding of the type and density of cultural resources in the vicinity of the Project Area. This report summarizes the methods SWCA used to complete the desktop review and presents the results of the background research. It does not serve as Section 106 clearance for the proposed project.

2 REGULATORY FRAMEWORK

Projects in Michigan can come under the purview of two primary cultural resources regulations, the National Historic Preservation Act (NHPA) and Michigan's Natural Resources and Environmental Protection Act. Both are administered by the Michigan State Historic Preservation Office (MI SHPO).

If the project is deemed a federal undertaking (requiring a federal permit, license, or approval; being located on federally owned or managed land; or receiving federal financial assistance), a cultural resources survey most likely would be mandated to ensure compliance with Section 106 of the NHPA. The scope of required cultural resources surveys would then be determined by the functioning federal lead agency in cooperation with the MI SHPO and, if applicable, the pertinent Tribal Historic Preservation Offices as defined in both Section 101 of the National Environmental Policy Act and Section 106 of the NHPA.

Under Michigan law, the state oversees all archaeology performed on state land. The Natural Resources and Environmental Protection Act (Public Act 451 of 1994, Part 761) requires that a permit be obtained prior to undertaking any archaeological investigation on state land.

Public Act 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 megawatts or more, to wind projects with a capacity of 100 megawatts or more, and to energy storage facilities with a capacity of 50 megawatts or more. Public Act 233allows developers the option of applying to the Michigan Public Service Commission (MPSC) to construct utility-scale renewable energy facilities if the local unit of government does not have a compatible renewable energy ordinance. If a compatible renewable energy ordinance is in place, the developer must apply with the local unit of government first, but if the project is denied, the developer may submit to the MPSC for approval. Projects that fall into these categories must identify and provide information on the effects of the project on environmental, natural, and cultural resources.

The project will occur solely on privately held land; thus, no state or local laws requiring archaeological investigations or surveys are anticipated to apply for this project. However, Public Act 233 requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC.

3 METHODOLOGY

SWCA initially submitted a request for in-person research to the MI SHPO on April 7, 2023. Staff at the MI SHPO approved the request and scheduled a research appointment for April 20, 2023. An SWCA archaeologist obtained information in person on previous cultural resources surveys, previously recorded archaeological resources, and previously recorded postcontact architectural resources within the Study Area.

As the Project Area and Study Area were revised in fall 2024, SWCA submitted a second request to the MI SHPO for archaeology and survey site files within the revised Study Area. MI SHPO provided all available records on December 9, 2024. Due to the ongoing updates to the MI SHPO's database, a process that was initiated on February 24, 2024, only archaeology files are currently available. Postcontact architecture files and both postcontact architectural and archaeological survey reports are not currently available as the MI SHPO are scanning these files for upload into a new database. As such, SWCA relied on the April 2023 postcontact architectural resource files and survey reports for this review. SWCA additionally reviewed the National Register of Historic Places (NRHP) database for Michigan as the best available recent data regarding architectural resources.

In addition to the site file search, SWCA investigated historic plat and topographic maps and historic aerial imagery of the Project Area and Study Area. SWCA also researched environmental factors such as modern and historic land use and soil units mapped by the Natural Resources Conservation Service (NRCS) to determine the likelihood of the project to encounter previously unrecorded precontact or postcontact archaeological resources.

4 RESULTS

4.1 Physiography, Geology, and Soils

The Project Area is situated within the Erie-Huron Lake Plain of the Eastern Lake section of the Central Lowland province of the Interior Plains (NRCS 2022:343). The Erie-Huron Lake Plain is a fairly level glacial lake plain with scattered sandy ridges formed by former shorelines and moraines. Elevation ranges from approximately 570 to 815 feet (175 to 250 meters [m]), whereas local relief averages 10 feet (3 m). Major confluences in the Erie-Huron Lake Plain include the Clinton, Huron, and Saginaw Rivers, which empty into the Great Lakes. The Project Area is located within the Floodwood Creek-River Raisin watershed and the Big Meadow Drain-Black Creek watershed, which empty into the River Raisin (U.S. Environmental Protection Agency 2023). Mississippian- to Silurian-age limestone, shale, and dolomite are common along the surface and along the shores of Lake Erie and Lake Huron. Broad, level, and somewhat poorly drained lake plains feature American beech, sugar maple, silver maple, green ash, pin oak, swamp white oak, and American elm, whereas sandy areas feature eastern white pine, eastern hemlock, and other coniferous trees (NRCS 2022:344).

This ecoregion is also part of the Maumee Lake Plain and the Ann Arbor Moraines sub-subsections. The Maumee Lake Plain is a broad, flat, glaciated clay lake plain with rich, loamy soils deeply mantled by till and outwash and dissected by broad glacial drainageways containing sandy soils (Albert 1995). This region formerly included beech-sugar maple forest, elm-ash forest, deciduous swamps, white oak-black oak savannas, wet prairies, and coastal marshes, but now has been largely cultivated (Albert 1995; NRCS 2022). The Ann Arbor Moraines sub-subsection is a long, narrow band of fine- and medium-textured end and ground moraine bordered by flat lake plain on the east and by sandy outwash, end moraine, and ice-contact features to the west. This region formerly supported oak and oak-hickory forests, with oak

savannas along the western edge (Albert 1995). Major wildlife species in the Erie-Huron Lake Plain area include white-tailed deer; cottontail rabbits; squirrels; raccoons; pheasants; bobwhite quail; songbirds; various species of snakes, frogs, and turtles; sunfish; perch; bass; walleye; catfish; carp, sucker; and northern pike.

There are 40 soil series mapped within the Project Area by the NRCS (Table 1). The soils range from very poorly drained to excessively drained loams to sandy loams. The most common soils for the Project Area include Brady and Macomb loams, 0 to 3 percent slopes; Colwood very fine sandy loam, 0 to 3 percent slopes; Wauseon loam, 0 to 3 percent slopes; Ziegenfuss clay loam, 0 to 1 percent slopes; Brady and Macomb sandy loams, 0 to 3 percent slopes; and Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes. These soil types, and their implication for site formation processes and archaeological potential, are discussed further in Section 4.6.

Table 1. Soils within the Project Area

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
BbA	Berrien loamy sand, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BbB	Berrien loamy sand, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcA	Berrien sandy loam, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcB	Berrien sandy loam, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BhA	Brady sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on strand plains	Loamy over sandy and gravelly glaciofluvial deposits
BkA	Brady and Macomb loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BnA	Bronson sandy loam, 0 to 3 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BnB	Bronson sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BoA	Brookston loam, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
CbB	Cadmus sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over loamy till
CeA	Colwood very fine sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CgA	Conover loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Loamy till
GbA	Genesee sandy loam, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
GcA	Genesee and Eel loams, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GgA	Griffin and Sloan loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Clayey till
KbC	Kendallville sandy loam, 7 to 15 percent slopes	Well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over till
KeA	Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on deltas	Stratified loamy glaciofluvial deposits
LcA	Linwood muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Wood organic material over loamy till
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Drainageways on till-floored lake plains	Sandy and/or loamy glaciofluvial deposits over loamy till
NaA	Nappanee silt loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Clayey till
NbB	Nappanee loam, 3 to 7 percent slopes	Somewhat poorly drained	Knolls on ground moraines	Clayey till
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	Somewhat poorly drained	Knolls on ground moraines	Clayey till
OcC	Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded	Excessively drained	Beaches on till-floored lake plains	Glaciofluvial deposits and/or sandy glaciolacustrine deposits over loamy till
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	Poorly drained	Depressions on till plains	Loamy till
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PdB	Plainfield and Berrien loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PeB	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PwmaaA	Pewamo clay loam, dense substratum, 0 to 1 percent slopes	Poorly drained	Drainageways on nearshore zones (relict), flats on nearshore zones (relict)	Clayey till over dense till
RbA	Rollin muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Herbaceous organic material over marl
SbA	Sebewa sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on glacial drainage channels	Loamy over sandy and gravelly glaciofluvial deposits
Sf	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	Poorly drained	Drainageways on stream terraces, drainageways	Loamy drift over sandy and gravelly outwash
WcA	Wauseon loam, 0 to 3 percent slopes	Poorly drained	Depressions on till-floored lake plains	Glaciolacustrine deposits over clayey till

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	Poorly drained	Wave-worked till plains	Clayey till over loamy till
W	Water	N/A	N/A	N/A

Source: NRCS (2024).

4.2 Historical Land Use

SWCA reviewed historic plat and topographic maps, as these sources provide information on past land use within the Project Area and Study Area that may indicate the probability of encountering significant precontact and postcontact cultural resources in or near the Project Area. The historic maps indicate that there has been a general consistency in the road network and land-use patterns from the late nineteenth century into the modern era in the Study Area.

The earliest available map of the Project Area is an 1819 General Land Office survey map (Bureau of Land Management General Land Office 2024). The Project Area is uninhabited. The River Raisin is drawn as a winding water course east of the Project Area. There are patches of marshlands, and tributaries are marked but not fully drawn. No structures are depicted. Palmyra and Lenawee Junction have not yet been established.

The first available plat map, dated 1874, shows that the Project Area and Study Area had been divided into large landholdings. Residences, schools, and churches are depicted. Roads and three railroads also are in place, including the Lenawee County Railroad and Palmyra Road. The current U.S. Highway 233 is shown as a railroad. Several structures are depicted on landholdings within the Project Area. Some of these structures are adjacent to orchards or small agricultural fields. There are branches of unnamed tributaries flowing throughout the Project Area, one of which is the modern Big Meadow Drain (Everts and Stewart 1874).

By 1893, the Project Area is depicted similarly to the 1874 plat. More landowners have appeared, represented by smaller landholdings, and structures are depicted within the Project Area. The unnamed tributaries are still depicted, running through the central and southern portions of the Project Area (Cadwell 1893).

The 1916 plat map shows an increase in landowners once more as the communities of Lenawee Junction and Palmyra continue to grow. Structures also are depicted on these parcels in the Project Area and are shown mostly along roads. U.S. Highway 233 is depicted as the Toledo Western electric railroad. There is another railroad that runs north-south to the Toledo Western electric railroad, connecting from Adrian to Palmyra within the Project Area. This segment of rail had been a road on the 1874 and 1893 plat maps. Several tributaries also are shown within the Project Area (Ogle 1916).

The 1921 plat map does not show individual structures beyond churches and schools, neither of which are in the Project Area. Landowner names are given, and the road network and railroads appear in the same location as on previous plats (*Adrian Daily Telegram* 1921). The 1928 plat presents the same information (*Adrian Daily Telegram* 1928).

SWCA also reviewed historic topographic maps to determine the land use of the Project Area and Study Area. Four historic topographic maps from 1939 to 1972 show that there has been little development from the early twentieth century to the present (U.S. Geological Survey [USGS] 2024). On the earliest available topographic map (Blissfield, Michigan, 1939, 1958 edition), multiple structures are shown in the

Project Area along roadways. The tributaries shown on the plat maps are named and shown: Big Meadow Drain, Bixby Drain, and Grinnell Drain. The road network and railroads are also depicted. The 1941 Blissfield, Michigan, topographic map reveals a similar image. The 1972 Palmyra, Michigan, and 1972 Tecumseh South, Michigan, topographic quadrangles name most of the roads in the Project Area, and they show that residential development had not increased outside of Palmyra and Adrian. Transmission and telecommunication cables are also depicted (USGS 2024).

A review of 17 aerial photographs taken between 1955 and 2022 indicates that minimal land development occurred within the Project Area and its environs. On the aerial images beginning in 1955, the landscape is agricultural. Isolated farmsteads are visible along roadways outside of Palmyra, Lenawee Junction, and Adrian. Drainages are visible either as scars on the landscape or are lined with trees, as is the River Raisin. There are some stands of trees throughout the Project Area. Between 1955 and 2022, no noticeable changes occur to the land use in the Project Area or Study Area (Historic Aerials 2024).

4.3 Previous Cultural Resources Surveys

A review of MI SHPO records identified one cultural resources survey that was conducted in the Project Area and two cultural resources surveys conducted within the Study Area (Table 2). Project ER00-7.17.161134 was a reconnaissance investigation conducted in 2017 by Archaeological Consultants of Ossian. The survey area covered 0.44 acre of land, and no cultural resources were identified during the survey (Stillwell 2017). Project ER17-391 was conducted for the Howard Street/West Michigan CMAQ and Rehabilitation project; however, the MI SHPO records did not contain information on the surveyors, year, or report title. Project B17-258, identified on quad maps in the MI SHPO research repository as Lauterbur 2016, was a Phase I archaeological survey conducted in support of the replacement of the River Raisin Bridge in Palmyra, Michigan. The MI SHPO records did not include information on the extent of the survey; however, no archaeological sites were identified during the survey.

Table 2. Previous Cultural Resources Surveys in the Study Area

Project ID	Project Name	Survey Year	Surveyors	Report Title	Location
ER00-7.17.161134	G2 Cellular Tower Site Review #161134	2017	Archaeological Consultants of Ossian	*An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project #161134) in Palmyra, Lenawee Conty, Michigan. 17FR29Mi.*	Project Area
ER17-391	Howard Street/ West Michigan CMAQ and Rehabilitation	None recorded	None recorded	None recorded	Study Area
B17-258	Lauterbur 2016	2016	Michigan Department of Transportation	*Archaeological Investigations at US-223 River Raisin Bridge Replacement, Palmyra, Lenawee County.*	Study Area

4.4 Previously Recorded Archaeological Sites

[redacted]

[redacted]

4.5 Previously Recorded Architectural Resources and Cemeteries

SWCA reviewed the National Park Service's NRHP database for Lenawee County, Michigan, regarding information on historic districts, buildings, archaeological sites, and other properties eligible for or listed in the NRHP. The NRHP database did not identify any NRHP-listed resources within the Project Area (National Park Service 2024).

SWCA also reviewed historic architecture data provided by the MI SHPO in April 2023. No previously recorded architectural resources are located within the Project Area; three architectural resources are located in the Study Area (Table 4; Appendix A: Figure 5).

No recorded cemeteries are present in the Project Area; two postcontact cemeteries (Palmyra Village Cemetery and Crane Cemetery) are located within the Study Area (Table 5; Appendix A: Figure 5). Palmyra Village Cemetery was included in the MI SHPO site file data, while Crane Cemetery was identified through archival research of historic topographic maps. Due to the data gap in the MI SHPO site file records since February 2024, it is not clear if Crane Cemetery is still absent from MI SHPO site file records.

Table 4. Previously Recorded Historic Architectural Resources in the Study Area

Site ID	Historic Name	City	NRHP Status	Location
P23943	Palmyra Presbyterian Church	Palmyra	Unevaluated	Study Area
P61449	Bruce Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area
P61451	Scott Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area

Table 5. Previously Recorded Cemeteries in the Study Area

Historic Name	Record Source	Location
Palmyra Village Cemetery	MI SHPO site file data	Study Area
Crane Cemetery	Archival research	Study Area

4.6 Geoarchaeology

Geoarchaeology, which is a multidisciplinary field that incorporates topography, geomorphology, geology, and soils, helps archaeologists to understand how geological processes have influenced the preservation of archaeological sites. Research conducted by Monaghan and Lovis (2005) demonstrates that deeply buried soils have an increased probability of sustaining cultural resources where fluvial deposits overlie alluvial deposits as a result of waterways breaching their banks. Monaghan and Lovis developed a predictive geoarchaeological model that takes these effects into account and classifies an area's likelihood of having cultural resources from Low to High-Very High.

Based on the Monaghan and Lovis (2005) model, the Project Area intersects with areas modeled as having moderate to high potential for deeply buried archaeological deposits (Figure A-6). [redacted] Otherwise, the remainder of the Project Area is largely mapped as exhibiting a low potential for deeply buried archaeological deposits.

[redacted]

4.7 Cultural Resources Context and Potential

The potential of the Project Area to contain cultural resources was developed through examination of the natural and topographical characteristics of the Project Area and available historic-era maps and aerial photographs.

4.7.1 Potential for Precontact Archaeological Sites

[redacted]

4.7.2 Potential for Postcontact Archaeological Sites

[redacted]

5 SUMMARY AND RECOMMENDATIONS

In summary, the records review established that one cultural resources survey has been conducted previously within the Project Area, and two cultural resources surveys have been conducted in the Study Area. These compliance surveys were negative and did not result in the recordation of cultural resources within the Project Area or the Study Area. However, [redacted] None of the archaeological sites within the Project Area have been evaluated for listing in the NRHP. There are no previously recorded architectural resources within the Project Area and three architectural resources in the Study Area. Based on MI SHPO records and a review of the NRHP, there are no NRHP-listed resources located within the Project Area or Study Area.

There is an overall moderate probability for significant precontact archaeological sites and a low to moderate probability for significant postcontact archaeological sites within the Project Area. [redacted]

Should the project require archaeological survey, the geoarchaeological modeling (Monaghan and Lovis 2005) suggests that shovel testing and/or deep testing (e.g., auguring) may be necessary [redacted] Pedestrian survey is a viable survey methodology as long as alluvial soils are confined to the plow zone (e.g., 12 inches [30 centimeters]); the limits of shovel testing is typically 3 feet (1 m).

Based on the MPSC regulations and our communications with the MI SHPO (personal communication, Sarah Surface-Evans and Scott Slagor, January 30, 2025), SWCA recommends initiating consultation with the MI SHPO. SWCA understands that MI SHPO has initiated a new consultation process for projects subject to permitting through the MPSC, and that the MI SHPO will provide expert testimony regarding cultural resources to the MPSC. To initiate the consultation process, the MI SHPO requests developers to complete a consultation application, in coordination with a professional archaeologist and architectural historian, The MI SHPO will provide their recommendations for next steps, including survey and avoidance requirements. SWCA understands that RWE will have 1 year after submittal of the MPSC permit application to obtain the approval of survey reports or recommendations submitted to the SHPO.

In keeping with Public Act 233, which requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC, SWCA recommends this document be provided to the MPSC for review. Approval from the MPSC is required before development within the boundaries of these sites occurs.

6 REFERENCES CITED

Adrian Daily Telegram. 1921. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21190/Palmyra+Township/Lenawee+County+1921/Michigan/. Accessed November 14, 2024.

———. 1928. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/1610467/Palmyra+Township++Raisin+River/. Accessed November 14, 2024.

Albert, Dennis A. 1995. Regional landscape ecosystems of Michigan, Minnesota and Wisconsin: A working map and classification. General Technical Report NC-178. U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota. Available at: https://www.nrs.fs.usda.gov/pubs/gtr/other/gtr-nc178/index.html. Accessed November 1, 2024.

Bureau of Land Management General Land Office. 2024. Original Survey Plat, Township 7 North, Range 4 East, 3rd Principal Meridian. Available at: https://glorecords.blm.gov/details/survey/default.aspx?dm_id=27676&sid=usa5y3jo.a4o#surveyDetailsTabIndex=0. Accessed November 14, 2024.

Cadwell, George D. 1893. Atlas of Lenawee County, Michigan. Geo. D. Cadwell and Company, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21077/Palmyra+Township/Lenawee+County+1893/Michigan/. Accessed November 14, 2024.

Everts and Stewart. 1874. Combination Atlas Map of Lenawee County, Michigan. Everts and Stewart, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/20906/Palmyra+Township/. Accessed November 14, 2024.

Historic Aerials. 2024. Historic Aerials Viewer. Available at: https://www.historicaerials.com/viewer. Accessed November 14, 2024.

Monaghan, G. William, and William A. Lovis. 2005. *Modeling Archaeological Site Burial in Southern Michigan: A Geoarchaeological Synthesis*. Michigan State University Press, East Lansing.

National Park Service. 2024. National Register of Historic Places Database and Research. Available at: https://www.nps.gov/subjects/nationalregister/database-research.htm. Accessed January 13, 2025.

Natural Resources Conservation Service (NRCS). 2022. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. Washington, D.C.

———. 2024. Custom Soil Report. Available at: http://websoilsurvey.nrcs.usda.gov. Accessed December 12, 2024.

Ogle, George A. 1916. Standards Atlas of Lenawee County, Michigan. Geo. A. Ogle Publishers and Engravers, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/22243/Palmyra+Township/Lenawee+County+1916/Michigan/. Accessed November 14, 2024.

Stillwell, Larry N. 2017. *An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project No. 161134) in Palmyra, Lenawee County, Michigan*. Archaeological Consultants of Ossian. On file at the Michigan State Historic Preservation Office, Lansing, Michigan.

U.S. Environmental Protection Agency. 2023. How's My Waterway Viewer. Available at: https://mywaterway.epa.gov/. Accessed November 14, 2024.

U.S. Geological Survey (USGS). 2024. National Geologic Map Database Project TopoView. Available at: https://ngmdb.usgs.gov/topoview/viewer/#14/41.8731/-83.9695. Accessed November 14, 2024.

APPENDIX A

Figures

Figure A-1. Location of the proposed Rouget Road, LLC Area in Michigan.

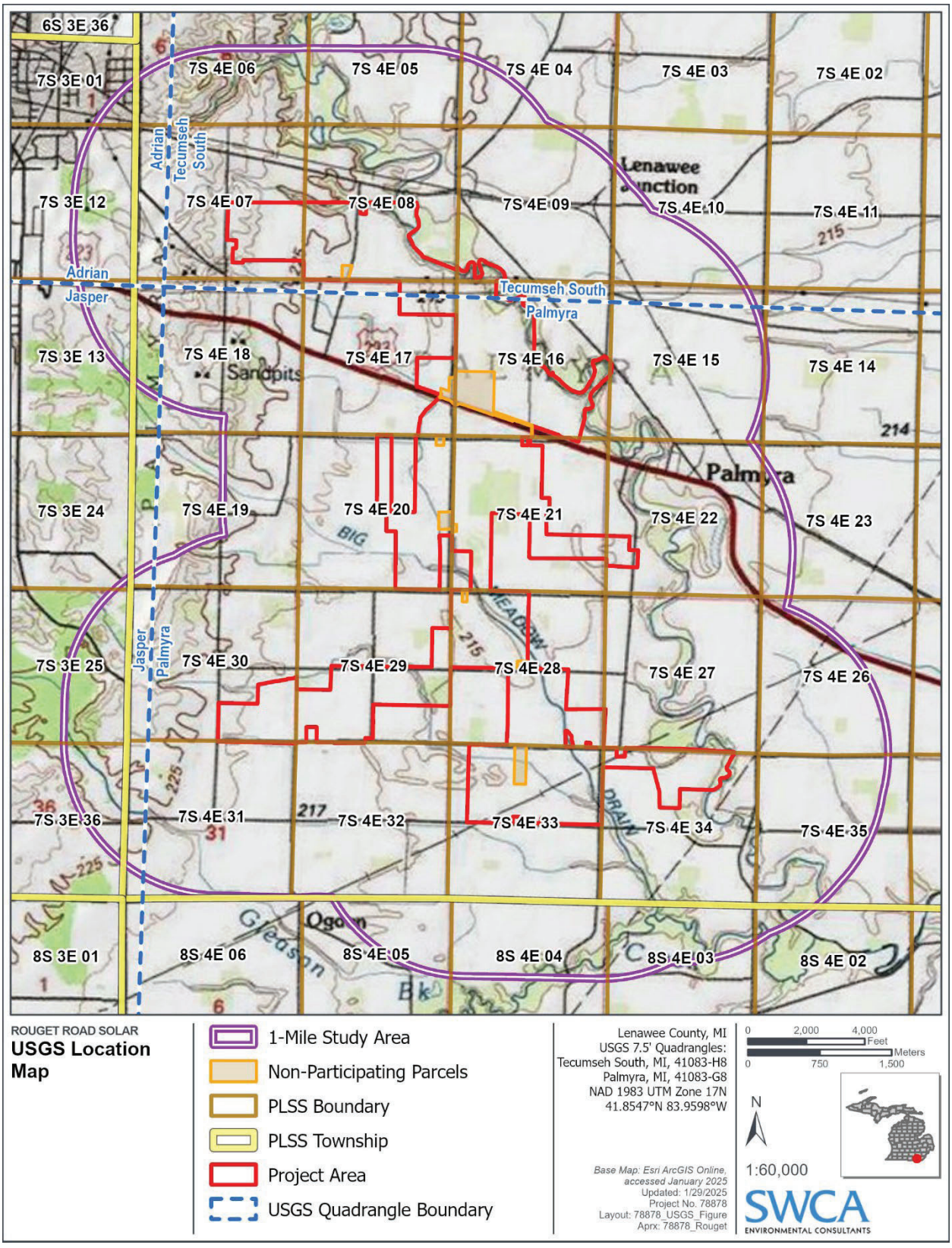

Figure A-2. Location of the Study Area for the proposed Rouget Road, LLC on a USGS topographic map.

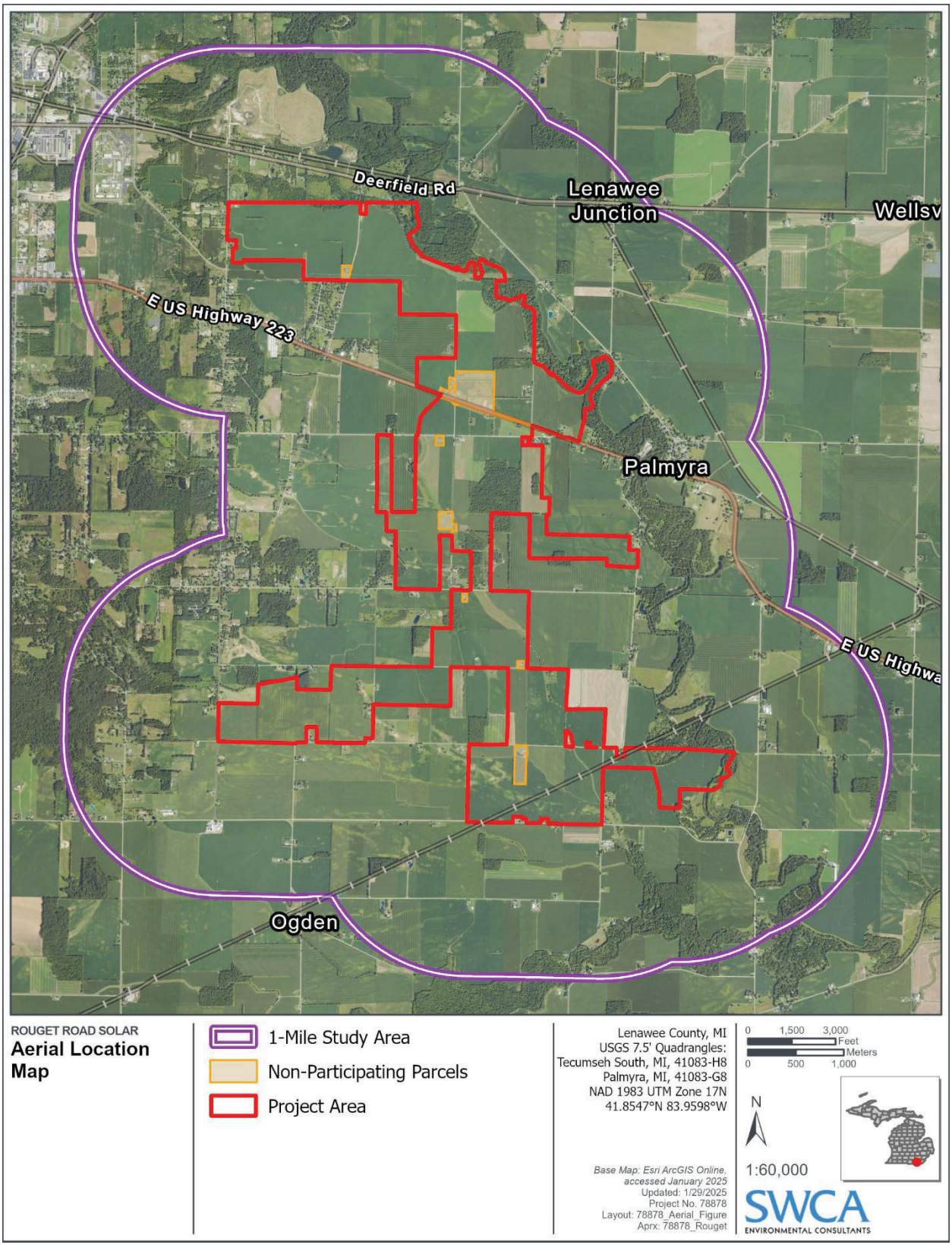

Figure A-3. Overview of the Study Area for the proposed Rouget Road, LLC on aerial imagery.

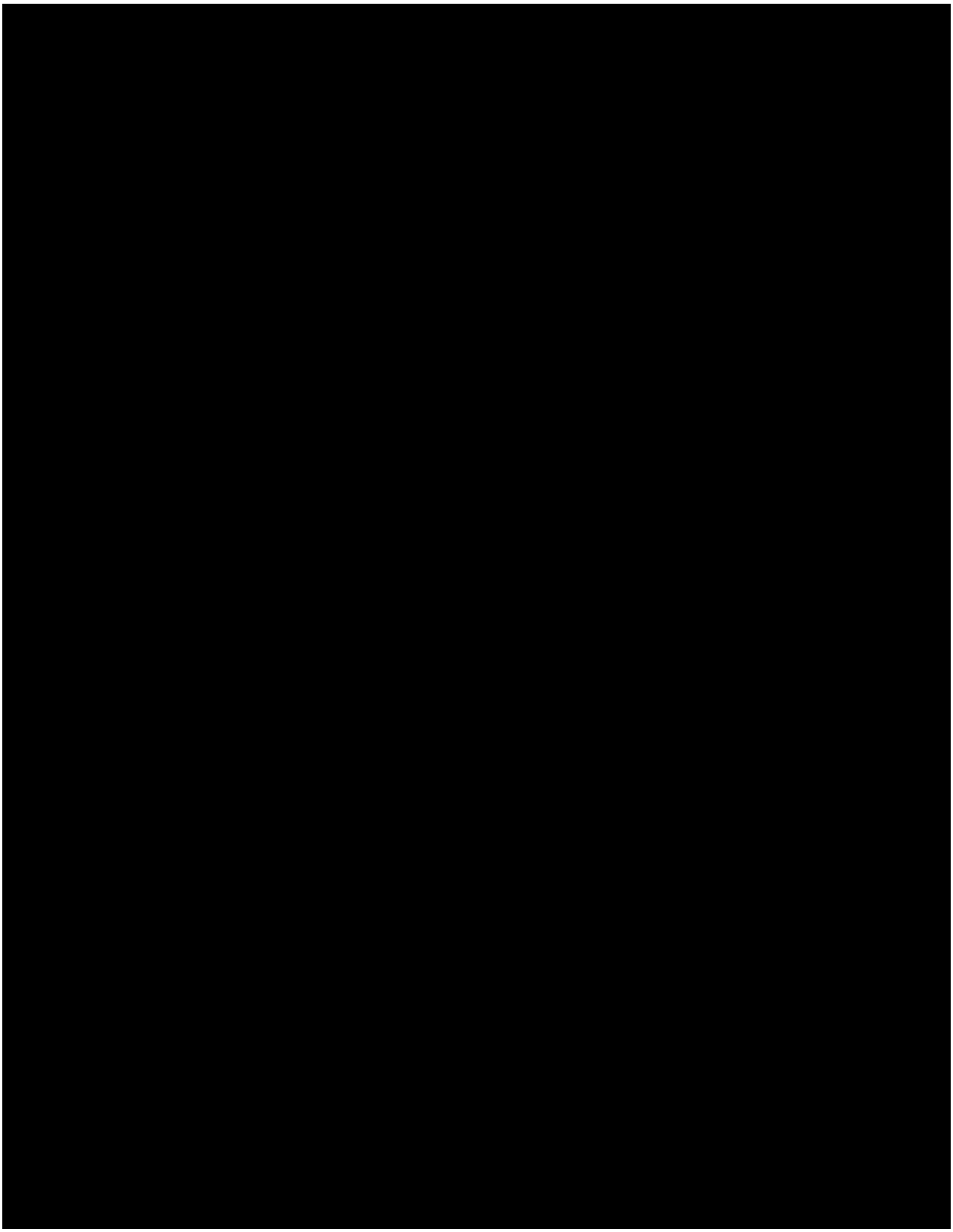

Figure A-4. Results of the background research for previously recorded cultural resources and previously conducted surveys.

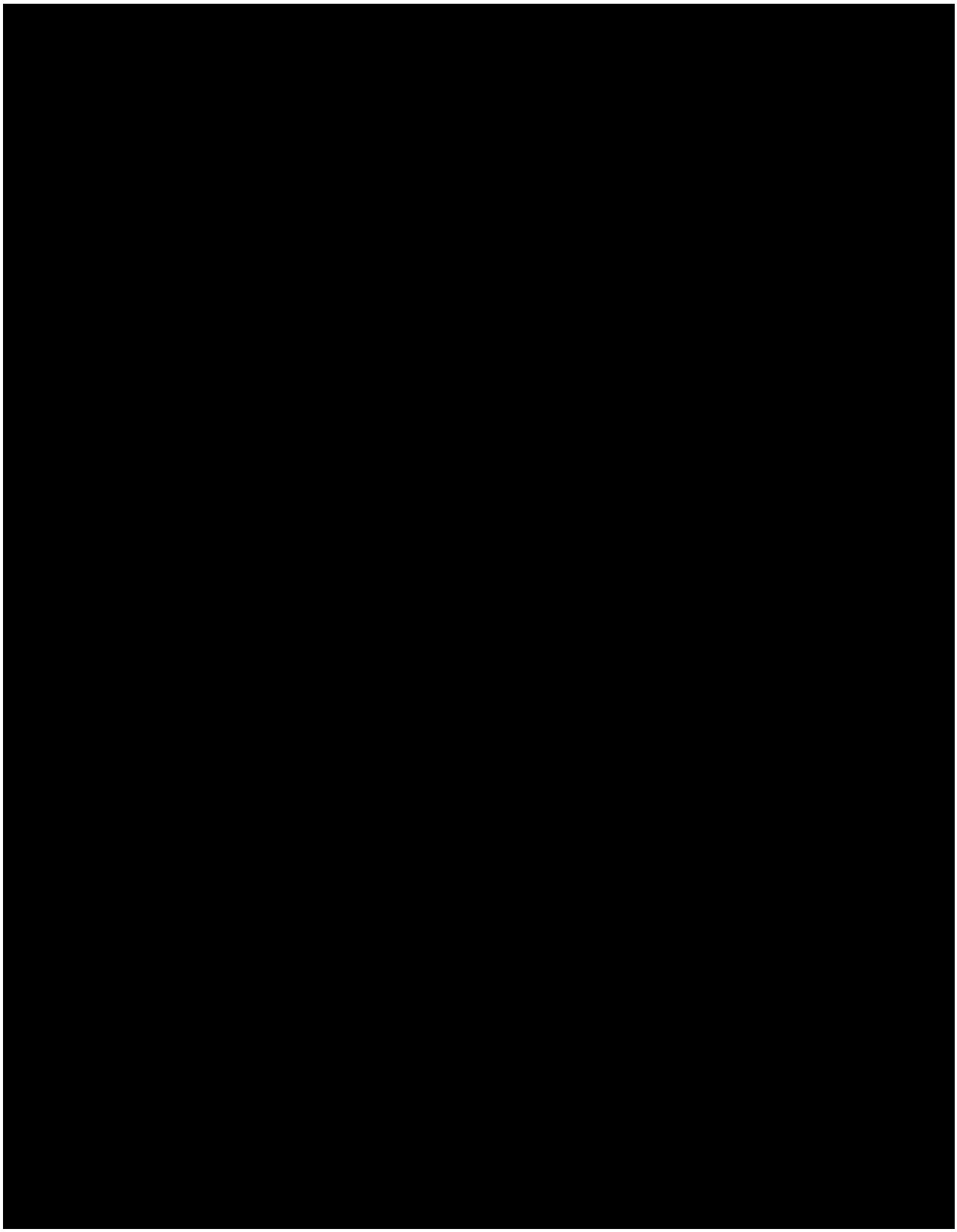

Figure A-5. Results of the background research for postcontact architectural resources and cemeteries.

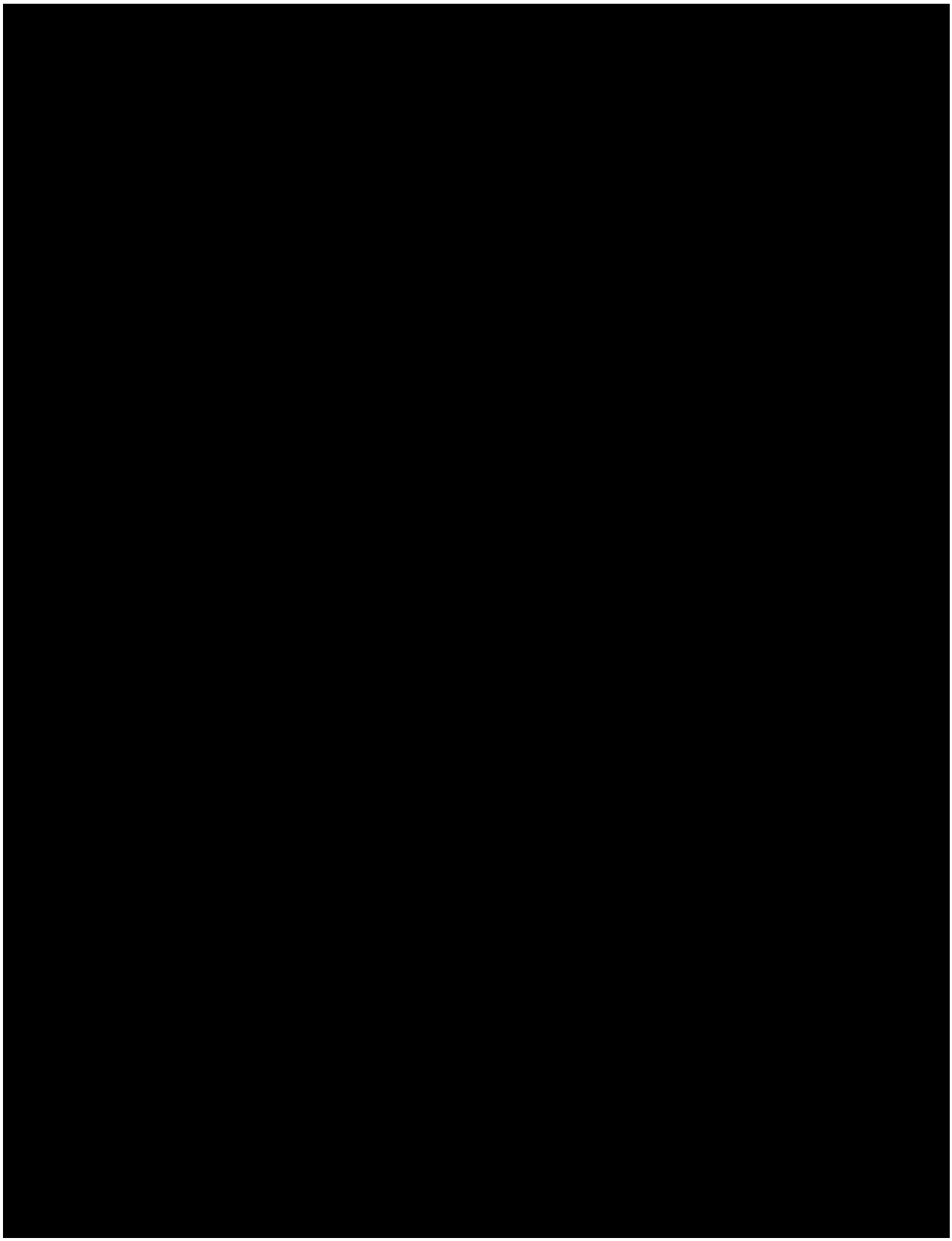

Figure A-6. Areas modeled as having moderate to high potential for deeply buried archaeological deposits in the Project Area and Study Area.

GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
MICHIGAN STRATEGIC FUND
STATE HISTORIC PRESERVATION OFFICE

QUENTIN L. MESSER, JR.
PRESIDENT

September 10, 2025

KEVIN COLE
ROUGET ROAD LLC
10250 PENLAWN DR.
JEROME, MI 49249

RE: SR25-23 PA233 Review Rouget Road, LLC Solar, T07S/R04E/Sec. 7, 8, 9, 15, 16, 17, 20 ,21, 22, 27, 28, 29, 30, 33, and 34, Palmyra Township, Lenawee County (MPSC)

Dear Mr. Cole:

We have received your request for review of the above-cited project under Public Act 233 of 2023 for Renewable Energy and Energy Storage Facility Siting (PA 233) at the above-noted location. We have reviewed the assessment prepared by SWCA, "Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan" and appreciate the information provided. To fully consider and address impacts to cultural and historic sites we require additional information, please send the following:

General

In the materials submitted, the project area boundaries in the submission form and in the Desktop Review do not match. Please ensure that we have the final project boundary maps included in all materials submitted to our office. Desktop Review states that the project plan will avoid archaeological sites, however, the project mapping provided does not make this apparent or clear. We cannot assess the impact of the proposed project on historic resources without accurate mapping information. Additionally, we would like to see the locations of staging areas, vehicle traffic, and any other areas that may have ground disturbance mapped.

Archaeological Resources

Due to the presence of previously documented sites within and near the project area, and the high archaeological sensitivity for the River Raisin valley generally, SHPO requests full archaeological survey for the entire project area, including staging areas. In particular, the boundaries of site 20LE28 are poorly delineated. In order to avoid this site, which is known to contain burials, additional survey methodologies may be necessary beyond pedestrian survey or shovel testing***. SHPO recommends consulting with our office and Tribal Nations with historic connections to this region to develop an appropriate methodology***, which may include geophysical prospection or historic human remains detection dog (HRD) survey. SHPO also recommends developing an Unanticipated Discovery Plan (UDP) for the project. A UDP specifies who will be contacted and what measures will be taken in the event of an unanticipated discovery of archaeological materials or human remains during the project implementation. Please see the UDP template attached, for an example of how these documents are organized. SHPO encourages the project proponent to work with consulting party tribes to develop an

appropriate UDP and protocol for handling human remains.

Above-ground Resources

SHPO concurs with the proposed methodology of utilizing the Above Ground Table in lieu of identification forms except that we require identification forms for properties that are identified as eligible. The table does not provide enough information for eligible properties. For eligible properties, photographs of all resources must also be included in an attachment with Architectural Properties Identification Form. When discussing effects to above-ground resources, please be sure to provide discussion of visual impacts as well as visual barriers in place that may play in to effects determinations. Also be sure that the Historic Resource Survey Report contains enough history and contextual information about the area and resources for SHPO to adequately assess eligibility.

Additional information must be submitted online through our Additional Information Portal.

Please note that our review cannot proceed until we are able to consider the information requested above. This letter is not concurrence. If you have any questions, please contact please contact Senior Archaeologist, Sarah Surface-Evans, surfaceevanss1@michigan.gov, (517) 282-7959 or Historian, Katlyn Burns Yancho, at 517-256-3416, burnsyanchok@michigan.gov. **Please reference our project number in all communication with this office regarding this review.** Thank you for your consultation.

Sincerely,

Sarah Surface-Evans, PhD, RPA
Senior Archaeologist

SES:KAK:KBY:SSE

Enclosure(s): UDP Template

Copy: Anna Gilmer, SWCA

2872 Mission Drive, Shelbyville, MI 49344 | {p} 269.397.1780 | gunlaketribe-nsn.gov

January 16, 2026

Kevin Cole
Development Manager
RWE Clean Energy LLC
rougetroadsola@rwe.com

Re: Rouget Road Solar Farm Project

Dear Mr. Cole,

The Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians' Tribal Historic Preservation Office has received the historic properties scoping request for comments regarding a proposed solar farm construction project in Palmyra, Lenawee County, Michigan. Our office has identified the presence of Historic Properties significant to the Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians within the Area of Potential Effect (APE). Due to the type of Historic Properties, we request to be included in the ongoing consultation process to identify and evaluate all Historic Properties, their eligibility for listing on the National Register of Historic Places (NRHP), and any and all direct, indirect, and cumulative effects to the historic properties as outlined in the NHPA, 36 CHR Part 800. We expect further evaluation efforts to be undertaken by the lead agency before any discussions or proposals of minimization and mitigation efforts occur. Please see the attached screenshot depicting the general location of the Historic Properties from the Archaeological Atlas of Michigan by Wilbert B. Hinsdale (page 53).

Due to the presence of previously documented sites within and near the project area, and the high archaeological sensitivity for the River Raisin valley generally, we request a full archaeological survey for the entire project area, including the staging areas. We request more information on ground disturbance methods, depths, and any laydown areas for the project in description and represented visually in maps. We also request that the survey includes non-invasive methods due to the sensitive nature of the previously documented sites. We can provide further recommendations in consultation with the Michigan State Historic Preservation Office. Additionally, we will include our Inadvertent Encounters Plan should one occur.

This office will be available to assist you in the future or during the course of this project if there is an unanticipated encounter with human remains, funerary objects, and artifacts. The subsequent identification of additional historic properties affected by the undertaking will require reinitiating Section 106 consultation related to all ongoing and proposed project work and the handling of "discoveries" per the National Historic Preservation Act (NHPA) implementing regulations, 36 CFR Part 800, and, as applicable, the Native American Graves and Repatriation Act (NAGPRA) and its implementing regulations, 43 CFR Part 10. In the event of an encounter with unanticipated human remains, funerary objects, and artifacts we request to be notified within 72 hours. At that time, the Tribe will determine if further consultation is necessary.

Please send any further materials to Phillip Peters, Historic Preservation Specialist, at Phillip.peters@glt-nsn.gov and cc Kaila Akina, Deputy THPO and Kaila.akina@glt-nsn.gov as well as the Section106@glt-nsn.gov inbox. Also, keep in mind that there may be other Tribal Nations that may have an interest or knowledge of cultural resources within the APE in addition to our own knowledge and records. We thank you for including the Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians in your consultation efforts and planning processes.

Sincerely,

For

Lakota Hobia
Tribal Historic Preservation Officer
Section106@glt-nsn.gov

Jonathan Libbon

From: Phillip Peters <phillip.peters@glt-nsn.gov>
Sent: Friday, January 16, 2026 2:33 PM
To: Jonathan Libbon
Cc: Kaila Akina; Section106
Subject: Fw: Rouget Road Solar Consultation Letter
Attachments: SR26-0055-001_MBPI 2026 01 16.pdf; River Raisin Valley 1.jpeg; River Raisin Valley 2.jpeg; MBPI Unanticipated Encounters Plan Template_March 2024.pdf

Sensitivity: Private

Good afternoon,

Please find the attached files for comment on the Rouget Road Solar Farm Project, our Inadvertent Encounters plan, and screenshots depicting the site location.

Thank you,

Phillip Peters
Historic Preservation Specialist
Gun Lake Tribe - Tribal Historic Preservation Office
(Match-E-Be-Nash-She-Wish band of Pottawatomi Indians)
2872 Mission Dr.
Shelbyville, MI 49344
{p} 269.397.1780, ext. 1260

From: Jonathan Libbon <JLibbon@swca.com>
Sent: Thursday, November 20, 2025 5:01 PM
To: Lakota Hobia <Lakota.Hobia@glt-nsn.gov>; Gun Lake Tribe - THPO Shared <mbpi_thpo@glt-nsn.gov>
Cc: Carol Mcknight <Carol.Mcknight@swca.com>; Aleyda Galan <aleyda.galan@swca.com>; Cole, J Kevin <jkevin.cole@rwe.com>; Quarles, Mark <mark.quarles@rwe.com>; Anna Gilmer <AGilmer@swca.com>
Subject: Rouget Road Solar Consultation Letter

Some people who received this message don't often get email from jlibbon@swca.com. Learn why this is important

CAUTION: This email was sent from outside of Gun Lake Tribe. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good Afternoon Lakota,

On behalf of Rouget Road Solar Farm LLC, a wholly-owned subsidiary of RWE Clean Energy LLC (RWE), we are reaching out to request your input on the Rouget Road Solar Farm Project, a proposed solar facility in Lenawee County, Michigan. The facility will require a state siting certificate from the Michigan Public Service Commission (MPSC). The attached letter and documentation outline the project and provide details on the cultural resource work completed to date. We are seeking comments from your area of expertise regarding any potential environmental or cultural effects associated with this project.

Please let me or Kevin Cole (cc'd), the project manager from RWE, know if you have any questions about the project.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

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Jonathan Libbon

From: Jonathan Libbon
Sent: Thursday, February 12, 2026 3:42 PM
To: 'Phillip Peters'
Cc: Kaila Akina; Section106; Quarles, Mark; Cole, J Kevin; Carol Mcknight; Aleyda Galan
Subject: RE: Rouget Road Solar Consultation Letter

Sensitivity: Private

Good Afternoon Mr. Peters,

I hope this message finds you well. Thank you for your office's response regarding the Rouget Road Solar Farm Project (the Project) in Lenawee County, Michigan.

In response to your request for additional project details, the Project would be developed across approximately 1,606 acres. The proposed solar facility would primarily consist of photovoltaic panels mounted on single-axis tracking structures, which allow the panels to follow the sun's movement. At the modules' maximum tracking position, the panels would reach a height of approximately 14 feet. The panels and the racking structure would be secured to the ground by piles driven into the ground approximately 7 to 15 feet below ground surface. Shallow trenches approximately 5 feet deep are also expected for the electrical conduits in limited areas.

As part of ongoing cultural resources coordination and our plan to conduct archaeological survey, we are requesting to meet with you and your staff to gather more information on the undisclosed, previously documented sites that you mentioned in your January 16, 2026 letter. This information will help us prepare for the upcoming archeological field investigation. We are already aware of some features (e.g. site 20LE28), and your additional information will further inform our investigation to avoid or minimize impacts to sensitive cultural resources with our site development.

We propose a one-hour Teams meeting on Friday, February 20, anytime between 1:00 and 2:30 p.m. ET, or on Friday, February 27, anytime between 10:00 a.m. and 3:00 p.m. Let us know if those days / times would work for your team. We can also meet in-person. Additionally, based on your preference we can invite staff from the Michigan State Historic Preservation Office and/or the Michigan Public Service Commission, which is the agency overseeing consultation for the Project. There is no federal involvement on the project.

We appreciate your time and consideration and look forward to working with you on this Project.

Thanks,

Jon

Jonathan Libbon
724.316.5547

From: Phillip Peters <phillip.peters@glt-nsn.gov>
Sent: Friday, January 16, 2026 2:33 PM
To: Jonathan Libbon <JLibbon@swca.com>
Cc: Kaila Akina <Kaila.Akina@glt-nsn.gov>; Section106 <Section106@glt-nsn.gov>
Subject: Fw: Rouget Road Solar Consultation Letter
Sensitivity: Private

Good afternoon,

Please find the attached files for comment on the Rouget Road Solar Farm Project, our Inadvertent Encounters plan, and screenshots depicting the site location.

Thank you,

Phillip Peters
Historic Preservation Specialist
Gun Lake Tribe - Tribal Historic Preservation Office
(Match-E-Be-Nash-She-Wish band of Pottawatomi Indians)
2872 Mission Dr.
Shelbyville, MI 49344
{p} 269.397.1780, ext. 1260

From: Jonathan Libbon <JLibbon@swca.com>
Sent: Thursday, November 20, 2025 5:01 PM
To: Lakota Hobia <Lakota.Hobia@glt-nsn.gov>; Gun Lake Tribe - THPO Shared <mbpi_thpo@glt-nsn.gov>
Cc: Carol Mcknight <Carol.Mcknight@swca.com>; Aleyda Galan <aleyda.galan@swca.com>; Cole, J Kevin <jkevin.cole@rwe.com>; Quarles, Mark <mark.quarles@rwe.com>; Anna Gilmer <AGilmer@swca.com>
Subject: Rouget Road Solar Consultation Letter

Some people who received this message don't often get email from jlibbon@swca.com. Learn why this is important

CAUTION: This email was sent from outside of Gun Lake Tribe. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good Afternoon Lakota,

On behalf of Rouget Road Solar Farm LLC, a wholly-owned subsidiary of RWE Clean Energy LLC (RWE), we are reaching out to request your input on the Rouget Road Solar Farm Project, a proposed solar facility in Lenawee County, Michigan. The facility will require a state siting certificate from the Michigan Public Service Commission (MPSC). The attached letter and documentation outline the project and provide details on the cultural resource work completed to date. We are seeking comments from your area of expertise regarding any potential environmental or cultural effects associated with this project.

Please let me or Kevin Cole (cc'd), the project manager from RWE, know if you have any questions about the project.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his

Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306

Bridgeville, Pennsylvania 15017

P 724.316.5547 | O 412.839.1001 ext. 5509

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Jonathan Libbon

From: Kaila Akina <Kaila.Akina@glt-nsn.gov>
Sent: Friday, February 27, 2026 6:25 PM
To: Jonathan Libbon
Cc: Section106; Quarles, Mark; Cole, J Kevin; Aleyda Galan; Carol Mcknight; Phillip Peters; Surface-Evans, Sarah (LEO); Brooks, Jennifer (LARA)
Subject: Re: Rouget Road Solar Project Meeting

Sensitivity: Private

Hi Jonathan,

Can you please include me on the emails and meetings for this project? I've also removed our Tribal Historic Preservation Officer, Lakota Hobia, since she is on leave for another month.

Thank you, and have a good weekend.

Kaila

Kaila Akina
Assistant Director/Deputy THPO
Gun Lake Tribe – Tribal Historic Preservation Office
(Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians)
2872 Mission Dr.
Shelbyville, MI 49344
{p} 269.397.1780, ext. 1240
{c} 269.370.2503

From: Phillip Peters <phillip.peters@glt-nsn.gov>
Sent: Friday, February 27, 2026 10:31 AM
To: Jonathan Libbon <JLibbon@swca.com>; Surface-Evans, Sarah (LEO) <SurfaceEvansS1@michigan.gov>; Brooks, Jennifer (LARA) <brooksj10@michigan.gov>
Cc: Lakota Hobia <Lakota.Hobia@glt-nsn.gov>; Section106 <Section106@glt-nsn.gov>; Quarles, Mark <mark.quarles@rwe.com>; Cole, J Kevin <jkevin.cole@rwe.com>; Aleyda Galan <aleyda.galan@swca.com>; Carol Mcknight <Carol.Mcknight@swca.com>
Subject: Re: Rouget Road Solar Project Meeting

Good morning,

3-4p works best for us, but we can do 1:00-2:30p if that works best for everyone.

Thank you,

Phillip Peters
Historic Preservation Specialist
Gun Lake Tribe - Tribal Historic Preservation Office
(Match-E-Be-Nash-She-Wish band of Pottawatomi Indians)
2872 Mission Dr.
Shelbyville, MI 49344
{p} 269.397.1780, ext. 1260

From: Jonathan Libbon <JLibbon@swca.com>
Sent: Thursday, February 26, 2026 6:34 PM
To: Phillip Peters <phillip.peters@glt-nsn.gov>; Surface-Evans, Sarah (LEO) <SurfaceEvansS1@michigan.gov>; Brooks, Jennifer (LARA) <brooksj10@michigan.gov>
Cc: Lakota Hobia <Lakota.Hobia@glt-nsn.gov>; Section106 <Section106@glt-nsn.gov>; Quarles, Mark <mark.quarles@rwe.com>; Cole, J Kevin <jkevin.cole@rwe.com>; Aleyda Galan <aleyda.galan@swca.com>; Carol Mcknight <Carol.Mcknight@swca.com>
Subject: Rouget Road Solar Project Meeting

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Good Afternoon Phillip, Sarah, and Jennifer,

In order to streamline the scheduling of the meeting to discuss the Rouget Road Project, I'm putting everyone on the same email chain. Due to prior obligations, Sarah Surface-Evans (MI SHPO) is unavailable to meeting on Friday 3/6.

Do folks have availability on Monday (3/9)? In conversations with RWE and the SHPO, these times are available (all times are [ET]):

- 1 – 2:30 pm
- 3 – 4 pm

I appreciate everyone's patience. Please let me know if any of these times work for you.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

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AGENDA

Date and Time	**MARCH 9, 2026, 3 PM (ET)**
Location	**VIRTUAL (MS TEAMS)**

ATTENDEES	
GUN LAKE TRIBE	Phillip Peters (Historic Preservation Specialist) Kaila Akina (Assistant Director/Deputy THPO)
RWE	Mark Quarles (Environmental & Permitting Manager) Kevin Cole (Development Manager)
MICHIGAN STATE HISTORIC PRESERVATION OFFICE (SHPO)	Sara Surface-Evans (Senior Archaeologist)
MICHIGAN PUBLIC SERVICE COMMISISON (MPSC)	Jennifer Brooks (Community and Tribal Liaison) Katie Krupp Gustavo Cordero (Public Utilities Engineer)
SWCA	Carolyn Stewart (Tribal Liaison) Jonathan Libbon (Cultural Resources Director) Aleyda Galan (Assistant Project Manager) Carol Mcknight (Project Manager)

OBJECTIVES

1. **Respond to Gun Lake Tribe's Letter**
2. **Describe the Project**
3. **Next Steps**

AGENDA

1. Brief Introductions
2. Overview of Engagement with Gun Lake Tribe
3. Project Descriptions
4. Identification and Evaluation of Historic Properties
5. Next Steps

ADDITIONAL NOTES

ACTION ITEMS

ASSIGNED TO	TASK	DUE DATE

Jonathan Libbon

Subject:	Rouget Road Solar - Project Discussion
Location:	Microsoft Teams Meeting
Start:	Mon 3/9/2026 3:00 PM
End:	Mon 3/9/2026 4:00 PM
Recurrence:	(none)
Meeting Status:	Meeting organizer
Organizer:	Jonathan Libbon
Required Attendees:	Jonathan Libbon; Phillip Peters; Surface-Evans, Sarah (LEO); Brooks, Jennifer (LARA); Quarles, Mark
Optional Attendees:	Carol Mcknight; Aleyda Galan; Cole, J Kevin; Kaila Akina; Section106; Carolyn Stewart; Cordero, Gustavo (LARA); Mullkoff, Sarah (LARA); Krupp, Katie (LARA); Slagor, Scott (LEO)

The objective of this meeting is to discuss the Rouget Road Solar Farm project in Lenawee County, Michigan, and provide an opportunity for the Gun Lake Tribe (Match-E-Be-Nash-She-Wish band of Pottawatomi Indians) to ask questions about the project and provide input.

A formal agenda will be sent later this week.

Microsoft Teams meeting

Join:

https://teams.microsoft.com/meet/27575795803028?p=Tp7WScgixmEmnOMq7A

Meeting ID: 275 757 958 030 28

Passcode: WQ3hS2J6

Need help? | System reference

Dial in by phone

+1 480-561-5811,,917440690# United States, Phoenix

Find a local number

Phone conference ID: 917 440 690#

For organizers: Meeting options | Reset dial-in PIN

Jonathan Libbon

From: Kaila Akina <Kaila.Akina@glt-nsn.gov>
Sent: Wednesday, March 18, 2026 9:20 AM
To: Jonathan Libbon
Cc: Quarles, Mark; Cole, J Kevin; Carolyn Stewart; Carol Mcknight; Aleyda Galan; Section106
Subject: Re: Rouget Road Solar: [redacted]

Sensitivity: Private

Hi Jonathan,

We have worked with [redacted]

Also, I'll be the main contact from our office as Phillip no longer works for us.

Thank you,
Kaila

Kaila Akina
Assistant Director/Deputy THPO
Gun Lake Tribe – Tribal Historic Preservation Office
(Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians)
2872 Mission Dr.
Shelbyville, MI 49344
{p} 269.397.1780, ext. 1240
{c} 269.370.2503

From: Jonathan Libbon <JLibbon@swca.com>
Sent: Tuesday, March 17, 2026 11:14 AM
To: Phillip Peters <phillip.peters@glt-nsn.gov>
Cc: Kaila Akina <Kaila.Akina@glt-nsn.gov>; Quarles, Mark <mark.quarles@rwe.com>; Cole, J Kevin <jkevin.cole@rwe.com>; Carolyn Stewart <Carolyn.Stewart@swca.com>; Carol Mcknight <Carol.Mcknight@swca.com>; Aleyda Galan <aleyda.galan@swca.com>
Subject: Rouget Road Solar: [redacted]

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Good Morning Phillip,

I hope you are doing well. I wanted to follow up our call from a few weeks back and see if you could share the contact information [redacted] that your office has worked with in the past? We would like to solicit quotes from them to assist on the Rouget Road Project.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

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Jonathan Libbon

From: Kaila Akina <Kaila.Akina@glt-nsn.gov>
Sent: Tuesday, March 24, 2026 2:22 PM
To: Jonathan Libbon
Cc: Jennifer Jordan Hall; Surface-Evans, Sarah (LEO)
Subject: Re: Rouget Road Solar: [redacted]

Sensitivity: Private

Good afternoon, Jon,

I'm following up on two items. Are you able to share an updated map showing where ground disturbing activities will be in the project area? I thought one of the team showed us one in the meeting we had.

[redacted]

Anyways, I'm hoping this makes sense and helps. I would also like to propose that we hop on a call to further discuss to ensure we're on the same page. Looking forward to hearing from you.

Migwetth (Thank you),
Kaila

Kaila Akina
Assistant Director/Deputy THPO
Gun Lake Tribe – Tribal Historic Preservation Office
(Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians)
2872 Mission Dr.
Shelbyville, MI 49344
{p} 269.397.1780, ext. 1240
{c} 269.370.2503

From: Jonathan Libbon <JLibbon@swca.com>
Sent: Tuesday, March 17, 2026 11:14 AM

To: Phillip Peters <phillip.peters@glt-nsn.gov>
Cc: Kaila Akina <Kaila.Akina@glt-nsn.gov>; Quarles, Mark <mark.quarles@rwe.com>; Cole, J Kevin <jkevin.cole@rwe.com>; Carolyn Stewart <Carolyn.Stewart@swca.com>; Carol Mcknight <Carol.Mcknight@swca.com>; Aleyda Galan <aleyda.galan@swca.com>
Subject: Rouget Road Solar: [redacted]

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Good Morning Phillip,

I hope you are doing well. I wanted to follow up our call from a few weeks back and see if you could share the contact information for the [redacted] that your office has worked with in the past? We would like to solicit quotes from them to assist on the Rouget Road Project.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

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Jonathan Libbon

Subject:	Rouget Road Survey Discussion
Location:	Microsoft Teams Meeting
Start:	Mon 5/11/2026 11:00 AM
End:	Mon 5/11/2026 12:00 PM
Recurrence:	(none)
Meeting Status:	Meeting organizer
Organizer:	Jonathan Libbon
Required Attendees:	Jonathan Libbon; Kaila Akina; Carolyn Stewart; Quarles, Mark; Cole, J Kevin
Optional Attendees:	Aleyda Galan; Carol Mcknight; Surface-Evans, Sarah (LEO); Brooks, Jennifer (LARA); Cordero, Gustavo (LARA); Mullkoff, Sarah (LARA); Krupp, Katie (LARA); Lakota Hobia

We would like to use this time to discuss the Rouget Road Project and establish next steps in ensuring the project does not impact the [redacted].

Microsoft Teams meeting

Join:

https://teams.microsoft.com/meet/249202688727384?p=cVfefxjNqjX52QkWv2

Meeting ID: 249 202 688 727 384

Passcode: i5f69cA6

Need help? | System reference

Dial in by phone

+1 480-561-5811,,397121879# United States, Phoenix

Find a local number

Phone conference ID: 397 121 879#

For organizers: Meeting options | Reset dial-in PIN

Jonathan Libbon

From: Lakota Hobia <Lakota.Hobia@glt-nsn.gov>
Sent: Wednesday, May 13, 2026 2:22 PM
To: Jonathan Libbon; Kaila Akina; jpeters180@mchsi.com
Cc: Aleyda Galan; Carol Mcknight; Quarles, Mark; Cole, J Kevin
Subject: Re: Rouget Road - [redacted]

Sensitivity: Private

Hi Jon,

11a tomorrow will work for me. Please set up a Teams/Zoom call link. I find it's easier to utilize that for these types of meetings (in case they want to share documents, etc.).

Thank you,
Lakota

–

Lakota Hobia
{p} 269.397.1780, ext. 1255
{c} 269.525.8125

From: Jonathan Libbon <JLibbon@swca.com>
Sent: Monday, May 11, 2026 4:22 PM
To: Lakota Hobia <Lakota.Hobia@glt-nsn.gov>; Kaila Akina <Kaila.Akina@glt-nsn.gov>; [redacted]
Cc: Aleyda Galan <aleyda.galan@swca.com>; Carol Mcknight <Carol.Mcknight@swca.com>; Quarles, Mark <mark.quarles@rwe.com>; Cole, J Kevin <jkevin.cole@rwe.com>
Subject: Rouget Road - [redacted]

CAUTION: This email was sent from outside of Gun Lake Tribe. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good Afternoon,

Lakota and Kaila – I've spoken with [redacted], and he has availability to meet with you on Thursday at 10 CT/11ET. He is cc'ed on this email. Please let me know if you would like me to set up a Teams/Zoom call or if you are good just exchanging numbers and connecting over the phone. I've attached a report that [redacted] has provided demonstrating some of their historical work.

[redacted] – when you can, please forward around a resume/CV showing your past work doing historic investigations.

Please let me know if there are questions or if I can be of further help.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

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Jonathan Libbon

From: Lakota Hobia <Lakota.Hobia@glt-nsn.gov>
Sent: Thursday, May 14, 2026 10:50 AM
To: Jonathan Libbon; Kaila Akina; jpeters180@mchsi.com; Surface-Evans, Sarah (LEO); Carolyn Stewart
Cc: Aleyda Galan; Carol Mcknight; Quarles, Mark; Cole, J Kevin; Brooks, Jennifer (LARA); Cordero, Gustavo (LARA)
Subject: Re: Rouget Road - [redacted]
Attachments: DRAFT_ArchHRD Survey Standards.docx

Sensitivity: Private

Good morning,

Attached is what I have been able to put together in the last two days regarding standards/QAQCs we've identified related to working with [redacted].

Best,
Lakota

–

Lakota Hobia
{p} 269.397.1780, ext. 1255
{c} 269.525.8125

From: Jonathan Libbon <JLibbon@swca.com>
Sent: Thursday, May 14, 2026 10:16 AM
To: Lakota Hobia <Lakota.Hobia@glt-nsn.gov>; Kaila Akina <Kaila.Akina@glt-nsn.gov>; jpeters180@mchsi.com <jpeters180@mchsi.com>; Surface-Evans, Sarah (LEO) <SurfaceEvansS1@michigan.gov>; Carolyn Stewart <Carolyn.Stewart@swca.com>
Cc: Aleyda Galan <aleyda.galan@swca.com>; Carol Mcknight <Carol.Mcknight@swca.com>; Quarles, Mark <mark.quarles@rwe.com>; Cole, J Kevin <jkevin.cole@rwe.com>; Brooks, Jennifer (LARA) <brooksj10@michigan.gov>; Cordero, Gustavo (LARA) <corderog@michigan.gov>
Subject: Rouget Road - [redacted]

CAUTION: This email was sent from outside of Gun Lake Tribe. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good Morning,

In advance of our upcoming call, please see [redacted], an example report, as well as two references speaking to [redacted] ability to complete the work.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

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Jonathan Libbon

From: Jonathan Libbon
Sent: Friday, May 15, 2026 12:58 PM
To: Kaila Akina; Carolyn Stewart; Quarles, Mark; Cole, J Kevin
Cc: Aleyda Galan; Carol Mcknight; Surface-Evans, Sarah (LEO); Brooks, Jennifer (LARA); Cordero, Gustavo (LARA); Mullkoff, Sarah (LARA); Krupp, Katie (LARA); Lakota Hobia
Subject: RE: Rouget Road Survey Discussion
Attachments: [redacted]

Sensitivity: Private

Good Afternoon,

I appreciate everyone's time this week and willingness to review materials and join calls. I wanted to send around a recap of all that was discussed and where things stand. Please feel free to respond if I mischaracterize anything.

[redacted] I'll follow-up next week with the results of the survey and provide a timeline for the reporting to be completed and sent around.

Please let me know if I missed anything or if anyone has any questions. Once again, thank you for your time this week.

Jon

Jonathan Libbon
724.316.5547

-----Original Appointment-----
From: Jonathan Libbon
Sent: Tuesday, May 5, 2026 12:45 PM
To: Jonathan Libbon; Kaila Akina; Carolyn Stewart; Quarles, Mark; Cole, J Kevin
Cc: Aleyda Galan; Carol Mcknight; Surface-Evans, Sarah (LEO); Brooks, Jennifer (LARA); Cordero, Gustavo (LARA); Mullkoff, Sarah (LARA); Krupp, Katie (LARA); Lakota Hobia
Subject: Rouget Road Survey Discussion
When: Monday, May 11, 2026 11:00 AM-12:00 PM (UTC-05:00) Eastern Time (US & Canada).

Where: Microsoft Teams Meeting
Sensitivity: Private

We would like to use this time to discuss the Rouget Road Project and establish next steps in ensuring the project does not impact [redacted]

Microsoft Teams meeting

Join:

https://teams.microsoft.com/meet/249202688727384?p=cVfefxjNqjX52QkWv2

Meeting ID: 249 202 688 727 384

Passcode: i5f69cA6

Need help? | System reference

Dial in by phone

+1 480-561-5811,,397121879# United States, Phoenix

Find a local number

Phone conference ID: 397 121 879#

For organizers: Meeting options | Reset dial-in PIN

Jonathan Libbon

From: Kaila Akina <Kaila.Akina@glt-nsn.gov>
Sent: Wednesday, June 3, 2026 6:19 PM
To: Jonathan Libbon; Lakota Hobia; Surface-Evans, Sarah (LEO); Cordero, Gustavo (LARA)
Cc: Quarles, Mark; Cole, J Kevin; Carol Mcknight; Aleyda Galan; Carolyn Stewart
Subject: Re: Rouget Road - [redacted] Survey Results and Next Steps

Sensitivity: Private

Hi Jonathan, and all,

I'm noting that I won't be available on June 4 or 5. I don't believe Lakota will be either due to out-of-the-office travel.

I could meet anytime at this point on Friday, June 12. If that doesn't work for everyone, I won't be available until the week of June 22. If Lakota can make an earlier date than June 22, please feel free to meet without me.

Migwetth,
Kaila

Kaila Akina
{p} 269.397.1780, ext. 1240
{c} 269-370-2503

Please note I will be out of the office most days between May 26 - June 19.

From: Jonathan Libbon <JLibbon@swca.com>
Sent: Wednesday, June 3, 2026 3:46 PM
To: Kaila Akina <Kaila.Akina@glt-nsn.gov>; Lakota Hobia <Lakota.Hobia@glt-nsn.gov>; Surface-Evans, Sarah (LEO) <SurfaceEvansS1@michigan.gov>; Cordero, Gustavo (LARA) <corderog@michigan.gov>
Cc: Quarles, Mark <mark.quarles@rwe.com>; Cole, J Kevin <jkevin.cole@rwe.com>; Carol Mcknight <Carol.Mcknight@swca.com>; Aleyda Galan <aleyda.galan@swca.com>; Carolyn Stewart <Carolyn.Stewart@swca.com>
Subject: Rouget Road - [redacted] and Next Steps

CAUTION: This email was sent from outside of Gun Lake Tribe. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good Afternoon,

I wanted to reach out and see what everyone's availability is to have a discussion regarding the results of [redacted] Rouget Road project. The Project team is available to discuss the results and next steps:

- Thursday (6/4): 12 (ET)
- Friday (6/5): 11-1 (ET)

If these times do not work, please let me know what your schedule looks like on Thursday and Friday of next week.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

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Jonathan Libbon

Subject:	Rouget Road [redacted] Survey Results and Next Steps
Location:	Microsoft Teams Meeting
Start:	Fri 6/12/2026 11:00 AM
End:	Fri 6/12/2026 12:00 PM
Recurrence:	(none)
Meeting Status:	Meeting organizer
Organizer:	Jonathan Libbon
Required Attendees:	Jonathan Libbon; Kaila Akina; Carolyn Stewart; Quarles, Mark; Surface-Evans, Sarah (LEO)
Optional Attendees:	Aleyda Galan; Carol Mcknight; Brooks, Jennifer (LARA); Cordero, Gustavo (LARA); Mullkoff, Sarah (LARA); Krupp, Katie (LARA); Lakota Hobia; Jennie Sturm; Cole, J Kevin; Gruzdowich, Nicholas; Swamynathan, Gautam

We would like to use this time to discuss the results of the [redacted] Survey on the Rouget Road Project and establish next steps for the project.

Microsoft Teams meeting

Join:

https://teams.microsoft.com/meet/276218218349708?p=KCuGSzWjf1xdDYWHU3

Meeting ID: 276 218 218 349 708

Passcode: AL6uh3dS

Need help? | System reference

Dial in by phone

+1 480-561-5811,,664349608# United States, Phoenix

Find a local number

Phone conference ID: 664 349 608#

For organizers: Meeting options | Reset dial-in PIN

Jonathan Libbon

From: Jonathan Libbon
Sent: Wednesday, June 17, 2026 5:26 PM
To: Surface-Evans, Sarah (LEO); Lakota Hobia
Cc: Kaila Akina; Quarles, Mark; Cole, J Kevin; Aleyda Galan; Carol Mcknight
Subject: Rouget Road Solar (SR25-23) - Results Mapping
Attachments: Rouget Road CR Overview Map_17June2026.pdf; Rouget Road HRDD Overview Map_17June2026.pdf

Sensitivity: Private

Good Afternoon Sarah and Lakota,

Attached is the mapping discussed during our call last week. Please let me know if you have any questions or if you need anything clarified.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

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Jonathan Libbon

From: Jonathan Libbon
Sent: Wednesday, July 1, 2026 7:26 PM
To: Lakota Hobia
Cc: Kaila Akina; Section106; Carol Mcknight; Aleyda Galan; Cole, J Kevin; Quarles, Mark; Surface-Evans, Sarah (LEO)
Subject: Rouget Road Solar Phase I Report

Sensitivity: Private

Hello Lakota,

The OneDrive link below provides access to the Phase I archaeology report for the Rouget Road Solar Project for your review and consideration. This report presents the findings of the archaeology survey, including the results of the [redacted] (Appendix G), and includes our recommendations for the cultural resources within our project's study area. A copy has also been submitted to the Michigan SHPO to facilitate their review.

Rouget Road Phase I Archaeology Report (SR25-23)

Please feel free to reach out with any questions or if you would like to discuss any aspect of the report in more detail.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

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Phase I Archaeology Survey Report for the Rouget Road Solar Project (July 2026)

This report contains information regarding the nature and location of archaeological resources and cultural heritage sites. Such information is considered sensitive, privileged, and confidential and is protected from public disclosure under applicable federal laws, regulations, and guidance governing archaeological and historic properties.

Accordingly, the Phase I Archaeological Survey Report is being withheld from this filing to protect sensitive cultural resource information.

The Applicant will provide the report directly to authorized reviewing agencies and other entities entitled to receive such information, subject to appropriate confidentiality protections and applicable law.

Jonathan Libbon

From: Jonathan Libbon
Sent: Wednesday, August 19, 2026 11:42 AM
To: Lakota Pochedley
Cc: 'Kaila Akina'; 'Section106'; Carol Mcknight; Aleyda Galan; 'Cole, J Kevin'; 'Quarles, Mark'
Subject: RE: Rouget Road Solar Phase I Report

Sensitivity: Private

Good Morning Lakota and Kalia,

I just wanted to bring this to the top of your inboxes and see if you had any questions about the Rouget Road report or had an estimated timeframe on when you may provide a response.

Thanks,

Jon

Jonathan Libbon
724.316.5547

From: Jonathan Libbon
Sent: Thursday, July 30, 2026 1:35 PM
To: 'Lakota Hobia' <lakota.hobia@glt-nsn.gov>
Cc: 'Kaila Akina' <kaila.akina@glt-nsn.gov>; 'Section106' <section106@glt-nsn.gov>; Carol Mcknight <Carol.Mcknight@swca.com>; Aleyda Galan <aleyda.galan@swca.com>; 'Cole, J Kevin' <jkevin.cole@rwe.com>; 'Quarles, Mark' <mark.quarles@rwe.com>; 'Surface-Evans, Sarah (LEO)' <surfaceevanss1@michigan.gov>
Subject: RE: Rouget Road Solar Phase I Report
Sensitivity: Private

Good Afternoon Lakota,

I wanted to follow up on your review of the archaeology report for the Rouget Road Solar Project and check on its current status. We have been discussing the report with the SHPO, and it appears they expect to provide their response to our submission later this week or early next week.

To help coordinate next steps, we would like to schedule a meeting during the week of 8/10 to discuss the review results and any feedback received. Do you anticipate completing your review by that time, and would you be available to participate in a meeting that week?

Please let me know if you have any questions or need any additional information to support your review. We appreciate your time and collaboration on this project and look forward to continuing the discussion.

Thanks,

Jon

Jonathan Libbon
724.316.5547

From: Jonathan Libbon
Sent: Wednesday, July 1, 2026 7:26 PM
To: Lakota Hobia <lakota.hobia@glt-nsn.gov>
Cc: Kaila Akina <kaila.akina@glt-nsn.gov>; Section106 <section106@glt-nsn.gov>; Carol Mcknight <Carol.Mcknight@swca.com>; Aleyda Galan <aleyda.galan@swca.com>; Cole, J Kevin <jkevin.cole@rwe.com>; Quarles, Mark <mark.quarles@rwe.com>; Surface-Evans, Sarah (LEO) <surfaceevanss1@michigan.gov>
Subject: Rouget Road Solar Phase I Report
Sensitivity: Private

Hello Lakota,

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Rouget Road Phase I Archaeology Report (SR25-23)

Please feel free to reach out with any questions or if you would like to discuss any aspect of the report in more detail.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

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Jonathan Libbon

From: Kaila Akina <Kaila.Akina@glt-nsn.gov>
Sent: Friday, August 21, 2026 2:43 PM
To: Jonathan Libbon; Lakota Hobia
Cc: Section106; Carol Mcknight; Aleyda Galan; Cole, J Kevin; Quarles, Mark
Subject: Re: Rouget Road Solar Phase I Report

Sensitivity: Private

Hello Jonathan,

Thank you for checking in. We will be able to finish our review by next Friday, August 28th and a response by August 31st at the latest.

Best,

Kaila Akina
Historic Preservation Specialist
Gun Lake Tribe – Tribal Historic Preservation Office
(Match-E-Be-Nash-She-Wish Band of Pottawatomi)
2872 Mission Dr.
Shelbyville, MI 49344
{p} 269.397.1780, ext. 1240
{c} 269.370.2503

From: Jonathan Libbon <JLibbon@swca.com>
Sent: Wednesday, August 19, 2026 11:42 AM
To: Lakota Hobia <lakota.pochedley@glt-nsn.gov>
Cc: Kaila Akina <kaila.akina@glt-nsn.gov>; Section106 <section106@glt-nsn.gov>; Carol Mcknight <Carol.Mcknight@swca.com>; Aleyda Galan <aleyda.galan@swca.com>; Cole, J Kevin <jkevin.cole@rwe.com>; Quarles, Mark <mark.quarles@rwe.com>
Subject: RE: Rouget Road Solar Phase I Report

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Good Morning Lakota and Kalia,

I just wanted to bring this to the top of your inboxes and see if you had any questions about the Rouget Road report or had an estimated timeframe on when you may provide a response.

Thanks,

Jon

Jonathan Libbon
724.316.5547

From: Jonathan Libbon
Sent: Thursday, July 30, 2026 1:35 PM
To: 'Lakota Hobia' <lakota.hobia@glt-nsn.gov>
Cc: 'Kaila Akina' <kaila.akina@glt-nsn.gov>; 'Section106' <section106@glt-nsn.gov>; Carol Mcknight <Carol.Mcknight@swca.com>; Aleyda Galan <aleyda.galan@swca.com>; 'Cole, J Kevin' <jkevin.cole@rwe.com>; 'Quarles, Mark' <mark.quarles@rwe.com>; 'Surface-Evans, Sarah (LEO)' <surfaceevanss1@michigan.gov>
Subject: RE: Rouget Road Solar Phase I Report
Sensitivity: Private

Good Afternoon Lakota,

I wanted to follow up on your review of the archaeology report for the Rouget Road Solar Project and check on its current status. We have been discussing the report with the SHPO, and it appears they expect to provide their response to our submission later this week or early next week.

To help coordinate next steps, we would like to schedule a meeting during the week of 8/10 to discuss the review results and any feedback received. Do you anticipate completing your review by that time, and would you be available to participate in a meeting that week?

Please let me know if you have any questions or need any additional information to support your review. We appreciate your time and collaboration on this project and look forward to continuing the discussion.

Thanks,

Jon

Jonathan Libbon
724.316.5547

From: Jonathan Libbon
Sent: Wednesday, July 1, 2026 7:26 PM
To: Lakota Hobia <lakota.hobia@glt-nsn.gov>
Cc: Kaila Akina <kaila.akina@glt-nsn.gov>; Section106 <section106@glt-nsn.gov>; Carol Mcknight <Carol.Mcknight@swca.com>; Aleyda Galan <aleyda.galan@swca.com>; Cole, J Kevin <jkevin.cole@rwe.com>; Quarles, Mark <mark.quarles@rwe.com>; Surface-Evans, Sarah (LEO) <surfaceevanss1@michigan.gov>
Subject: Rouget Road Solar Phase I Report
Sensitivity: Private

Hello Lakota,

The OneDrive link below provides access to the Phase I archaeology report for the Rouget Road Solar Project for your review and consideration. This report presents the findings of the archaeology survey, including [redacted]), and includes

our recommendations for the cultural resources within our project's study area. A copy has also been submitted to the Michigan SHPO to facilitate their review.

Rouget Road Phase I Archaeology Report (SR25-23)

Please feel free to reach out with any questions or if you would like to discuss any aspect of the report in more detail.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

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Jonathan Libbon

From: Kaila Akina <Kaila.Akina@glt-nsn.gov>
Sent: Friday, August 28, 2026 6:29 PM
To: Jonathan Libbon; Lakota Hobia
Cc: Section106; Carol Mcknight; Aleyda Galan; Cole, J Kevin; Quarles, Mark
Subject: Re: Rouget Road Solar Phase I Report

Sensitivity: Private

Good evening,

Thank you for your patience. We have reviewed the Phase I archaeological report for the Rouget Road Project. Here are our thoughts.

- We agree with the recommendation to have a physical boundary around site 20LE28. We also agree with MI SHPO's request of having a Secretary of the Interior-qualified archaeologist directing the laying out of the boundary before any construction work for the project. We request that the boundary be checked throughout construction activities to ensure it is maintained.
- We agree with the Unanticipated Discovery Plan being implemented during ground disturbance activity. In the plan, though, please update the MI SHPO contact to be Dr. Kate Frederick and include her contact information.
- For the archaeological materials that were recovered, where will they be stored and curated?

Thank you again for the report and incorporating the [redacted] and other attachments.

Please let us know if you have any questions.

Best,

Kaila Akina
Historic Preservation Specialist
Gun Lake Tribe – Tribal Historic Preservation Office
(Match-E-Be-Nash-She-Wish Band of Pottawatomi)
2872 Mission Dr.
Shelbyville, MI 49344
{p} 269.397.1780, ext. 1240
{c} 269.370.2503

From: Jonathan Libbon <JLibbon@swca.com>
Sent: Wednesday, August 19, 2026 11:42 AM
To: Lakota Hobia <lakota.pochedley@glt-nsn.gov>
Cc: Kaila Akina <kaila.akina@glt-nsn.gov>; Section106 <section106@glt-nsn.gov>; Carol Mcknight <Carol.Mcknight@swca.com>; Aleyda Galan <aleyda.galan@swca.com>; Cole, J Kevin <jkevin.cole@rwe.com>;

Quarles, Mark <mark.quarles@rwe.com>
Subject: RE: Rouget Road Solar Phase I Report

CAUTION: This email was sent from outside of Gun Lake Tribe. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good Morning Lakota and Kalia,

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Thanks,

Jon

Jonathan Libbon
724.316.5547

From: Jonathan Libbon
Sent: Thursday, July 30, 2026 1:35 PM
To: 'Lakota Hobia' <lakota.hobia@glt-nsn.gov>
Cc: 'Kaila Akina' <kaila.akina@glt-nsn.gov>; 'Section106' <section106@glt-nsn.gov>; Carol Mcknight <Carol.Mcknight@swca.com>; Aleyda Galan <aleyda.galan@swca.com>; 'Cole, J Kevin' <jkevin.cole@rwe.com>; 'Quarles, Mark' <mark.quarles@rwe.com>; 'Surface-Evans, Sarah (LEO)' <surfaceevanss1@michigan.gov>
Subject: RE: Rouget Road Solar Phase I Report
Sensitivity: Private

Good Afternoon Lakota,

I wanted to follow up on your review of the archaeology report for the Rouget Road Solar Project and check on its current status. We have been discussing the report with the SHPO, and it appears they expect to provide their response to our submission later this week or early next week.

To help coordinate next steps, we would like to schedule a meeting during the week of 8/10 to discuss the review results and any feedback received. Do you anticipate completing your review by that time, and would you be available to participate in a meeting that week?

Please let me know if you have any questions or need any additional information to support your review. We appreciate your time and collaboration on this project and look forward to continuing the discussion.

Thanks,

Jon

Jonathan Libbon
724.316.5547

From: Jonathan Libbon
Sent: Wednesday, July 1, 2026 7:26 PM
To: Lakota Hobia <lakota.hobia@glt-nsn.gov>
Cc: Kaila Akina <kaila.akina@glt-nsn.gov>; Section106 <section106@glt-nsn.gov>; Carol Mcknight <Carol.Mcknight@swca.com>; Aleyda Galan <aleyda.galan@swca.com>; Cole, J Kevin <jkevin.cole@rwe.com>; Quarles, Mark <mark.quarles@rwe.com>; Surface-Evans, Sarah (LEO) <surfaceevanss1@michigan.gov>
Subject: Rouget Road Solar Phase I Report
Sensitivity: Private

Hello Lakota,

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Rouget Road Phase I Archaeology Report (SR25-23)

Please feel free to reach out with any questions or if you would like to discuss any aspect of the report in more detail.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

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Jonathan Libbon

From: Jonathan Libbon
Sent: Monday, August 31, 2026 12:59 PM
To: Kaila Akina; Lakota Hobia
Cc: Section106; Carol Mcknight; Aleyda Galan; Cole, J Kevin; Quarles, Mark
Subject: RE: Rouget Road Solar Phase I Report

Sensitivity: Private

Good Afternoon Kaila,

We appreciate your response and the time you spent reviewing our report. Just to clarify:

- Regarding the physical boundary around site 20LE28, do you agree with the SHPO determination [redacted]
- For the artifacts, the landowners have requested that any artifacts found be returned to them.

Thanks,

Jon

Jonathan Libbon
724.316.5547

From: Kaila Akina <Kaila.Akina@glt-nsn.gov>
Sent: Friday, August 28, 2026 6:29 PM
To: Jonathan Libbon <JLibbon@swca.com>; Lakota Hobia <lakota.pochedley@glt-nsn.gov>
Cc: Section106 <section106@glt-nsn.gov>; Carol Mcknight <Carol.Mcknight@swca.com>; Aleyda Galan <aleyda.galan@swca.com>; Cole, J Kevin <jkevin.cole@rwe.com>; Quarles, Mark <mark.quarles@rwe.com>
Subject: Re: Rouget Road Solar Phase I Report
Sensitivity: Private

Good evening,

Thank you for your patience. We have reviewed the Phase I archaeological report for the Rouget Road Project. Here are our thoughts.

- We agree with the recommendation to have a physical boundary around site 20LE28. We also agree with MI SHPO's request of having a Secretary of the Interior-qualified archaeologist directing the laying out of the boundary before any construction work for the project. We request that the boundary be checked throughout construction activities to ensure it is maintained.
- We agree with the Unanticipated Discovery Plan being implemented during ground disturbance activity. In the plan, though, please update the MI SHPO contact to be Dr. Kate Frederick and include her contact information.
- For the archaeological materials that were recovered, where will they be stored and curated?

Thank you again for the report and incorporating the [redacted] and other attachments.

Please let us know if you have any questions.

Best,

Kaila Akina

Historic Preservation Specialist

Gun Lake Tribe – Tribal Historic Preservation Office

(Match-E-Be-Nash-She-Wish Band of Pottawatomi)

2872 Mission Dr.

Shelbyville, MI 49344

{p} 269.397.1780, ext. 1240

{c} 269.370.2503

From: Jonathan Libbon <JLibbon@swca.com>
Sent: Wednesday, August 19, 2026 11:42 AM
To: Lakota Hobia <lakota.pochedley@glt-nsn.gov>
Cc: Kaila Akina <kaila.akina@glt-nsn.gov>; Section106 <section106@glt-nsn.gov>; Carol Mcknight <Carol.Mcknight@swca.com>; Aleyda Galan <aleyda.galan@swca.com>; Cole, J Kevin <jkevin.cole@rwe.com>; Quarles, Mark <mark.quarles@rwe.com>
Subject: RE: Rouget Road Solar Phase I Report

CAUTION: This email was sent from outside of Gun Lake Tribe. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good Morning Lakota and Kalia,

I just wanted to bring this to the top of your inboxes and see if you had any questions about the Rouget Road report or had an estimated timeframe on when you may provide a response.

Thanks,

Jon

Jonathan Libbon

724.316.5547

From: Jonathan Libbon
Sent: Thursday, July 30, 2026 1:35 PM
To: 'Lakota Hobia' <lakota.hobia@glt-nsn.gov>
Cc: 'Kaila Akina' <kaila.akina@glt-nsn.gov>; 'Section106' <section106@glt-nsn.gov>; Carol Mcknight <Carol.Mcknight@swca.com>; Aleyda Galan <aleyda.galan@swca.com>; 'Cole, J Kevin' <jkevin.cole@rwe.com>; 'Quarles, Mark' <mark.quarles@rwe.com>; 'Surface-Evans, Sarah (LEO)' <surfaceevanss1@michigan.gov>
Subject: RE: Rouget Road Solar Phase I Report
Sensitivity: Private

Good Afternoon Lakota,

I wanted to follow up on your review of the archaeology report for the Rouget Road Solar Project and check on its current status. We have been discussing the report with the SHPO, and it appears they expect to provide their response to our submission later this week or early next week.

To help coordinate next steps, we would like to schedule a meeting during the week of 8/10 to discuss the review results and any feedback received. Do you anticipate completing your review by that time, and would you be available to participate in a meeting that week?

Please let me know if you have any questions or need any additional information to support your review. We appreciate your time and collaboration on this project and look forward to continuing the discussion.

Thanks,

Jon

Jonathan Libbon

724.316.5547

From: Jonathan Libbon
Sent: Wednesday, July 1, 2026 7:26 PM
To: Lakota Hobia <lakota.hobia@glt-nsn.gov>
Cc: Kaila Akina <kaila.akina@glt-nsn.gov>; Section106 <section106@glt-nsn.gov>; Carol Mcknight <Carol.Mcknight@swca.com>; Aleyda Galan <aleyda.galan@swca.com>; Cole, J Kevin <jkevin.cole@rwe.com>; Quarles, Mark <mark.quarles@rwe.com>; Surface-Evans, Sarah (LEO) <surfaceevanss1@michigan.gov>
Subject: Rouget Road Solar Phase I Report
Sensitivity: Private

Hello Lakota,

The OneDrive link below provides access to the Phase I archaeology report for the Rouget Road Solar Project for your review and consideration. This report presents the findings of the archaeology survey, including the results of the [redacted] (Appendix G), and includes our recommendations for the cultural resources within our project's study area. A copy has also been submitted to the Michigan SHPO to facilitate their review.

Rouget Road Phase I Archaeology Report (SR25-23)

Please feel free to reach out with any questions or if you would like to discuss any aspect of the report in more detail.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his

Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306

Bridgeville, Pennsylvania 15017

P 724.316.5547 | O 412.839.1001 ext. 5509

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Nottawaseppi Huron Band of the Potawatomi

From:	Jonathan Libbon
To:	"Onyleen.Zapata@nhbp-nsn.gov"
Cc:	Carol Mcknight; Aleyda Galan; Cole, J Kevin; Quarles, Mark; Anna Gilmer
Subject:	Rouget Road Solar Consultation Letter
Date:	Thursday, November 20, 2025 5:01:00 PM
Attachments:	Rouget Tribal Consulation LTR_20Nov2025.pdf image001.png
Sensitivity:	Private

Good Afternoon Onyleen,

On behalf of Rouget Road Solar Farm LLC, a wholly-owned subsidiary of RWE Clean Energy LLC (RWE), we are reaching out to request your input on the Rouget Road Solar Farm Project, a proposed solar facility in Lenawee County, Michigan. The facility will require a state siting certificate from the Michigan Public Service Commission (MPSC). The attached letter and documentation outline the project and provide details on the cultural resource work completed to date. We are seeking comments from your area of expertise regarding any potential environmental or cultural effects associated with this project.

Please let me or Kevin Cole (cc'd), the project manager from RWE, know if you have any questions about the project.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

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From:	Onyleen Zapata
To:	Jonathan Libbon
Cc:	Carol Mcknight; Aleyda Galan; Cole, J Kevin; Quarles, Mark; Anna Gilmer; Kennedy Swan
Subject:	RE: Rouget Road Solar Consultation Letter
Date:	Friday, November 21, 2025 12:42:54 PM
Attachments:	image001.png image002.png
Sensitivity:	Private

No, digital should be fine and we can print if needed on our end.

Migwėtth Thank you,

Onyleen Zapata (she/her/hers) | **Tribal Historic Preservation Officer**

NOTTAWASEPPI HURON BAND OF THE POTAWATOMI

Pine Creek Indian Reservation | Environmental Department | 1301 T Drive South, Fulton, MI 49052

o: 269.704.8347 | **c:** 269.406.1524 | **f:** 269.729.5920

Onyleen.Zapata@nhbp-nsn.gov | www.nhbp-nsn.gov

NOTTAWASEPPI HURON BAND OF THE POTAWATOMI

A FEDERALLY RECOGNIZED TRIBAL GOVERNMENT

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From: Jonathan Libbon <JLibbon@swca.com>
Sent: Friday, November 21, 2025 11:30 AM
To: Onyleen Zapata <Onyleen.Zapata@nhbp-nsn.gov>
Cc: Carol Mcknight <Carol.Mcknight@swca.com>; Aleyda Galan <aleyda.galan@swca.com>; Cole, J Kevin <jkevin.cole@rwe.com>; Quarles, Mark <mark.quarles@rwe.com>; Anna Gilmer <AGilmer@swca.com>; Kennedy Swan <Kennedy.Swan@nhbp-nsn.gov>
Subject: RE: Rouget Road Solar Consultation Letter
Sensitivity: Private

Yes – moving forward we will include Kennedy Swan on all communication.

Do you need physical copies of any of the documentation we provided?

Jonathan Libbon

724.316.5547

From: Onyleen Zapata <Onyleen.Zapata@nhbp-nsn.gov>
Sent: Friday, November 21, 2025 11:16 AM
To: Jonathan Libbon <JLibbon@swca.com>
Cc: Carol Mcknight <Carol.Mcknight@swca.com>; Aleyda Galan <aleyda.galan@swca.com>; Cole, J Kevin <jkevin.cole@rwe.com>; Quarles, Mark <mark.quarles@rwe.com>; Anna Gilmer <AGilmer@swca.com>; Kennedy Swan <Kennedy.Swan@nhbp-nsn.gov>
Subject: RE: Rouget Road Solar Consultation Letter
Sensitivity: Private

Bozho,

Can you also include our THPO Generalist Kennedy Swan, moving forward? I have cc'd her in on this response.

Migwėtth Thank you,

Onyleen Zapata (she/her/hers) | **Tribal Historic Preservation Officer**
NOTTAWASEPPI HURON BAND OF THE POTAWATOMI
Pine Creek Indian Reservation | Environmental Department | 1301 T Drive South, Fulton, MI 49052
o: 269.704.8347 | **c:** 269.406.1524 | **f:** 269.729.5920
Onyleen.Zapata@nhbp-nsn.gov | www.nhbp-nsn.gov

NOTTAWASEPPI HURON BAND OF THE POTAWATOMI
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From: Jonathan Libbon <JLibbon@swca.com>
Sent: Thursday, November 20, 2025 5:01 PM
To: Onyleen Zapata <Onyleen.Zapata@nhbp-nsn.gov>
Cc: Carol Mcknight <Carol.Mcknight@swca.com>; Aleyda Galan <aleyda.galan@swca.com>; Cole, J Kevin <jkevin.cole@rwe.com>; Quarles, Mark <mark.quarles@rwe.com>; Anna Gilmer <AGilmer@swca.com>
Subject: Rouget Road Solar Consultation Letter

Sensitivity: Private

***** EXTERNAL EMAIL WARNING - USE CAUTION *****

Good Afternoon Onyleen,

On behalf of Rouget Road Solar Farm LLC, a wholly-owned subsidiary of RWE Clean Energy LLC (RWE), we are reaching out to request your input on the Rouget Road Solar Farm Project, a proposed solar facility in Lenawee County, Michigan. The facility will require a state siting certificate from the Michigan Public Service Commission (MPSC). The attached letter and documentation outline the project and provide details on the cultural resource work completed to date. We are seeking comments from your area of expertise regarding any potential environmental or cultural effects associated with this project.

Please let me or Kevin Cole (cc'd), the project manager from RWE, know if you have any questions about the project.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

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11/20/2025

Dear Tribal Historic Preservation Officer and/or Tribal Cultural Representative,

As part of its responsibilities under Michigan Public Act 233 of 2023 (PA 233), *Renewable Energy and Energy Storage Facility Siting*, the Michigan Public Service Commission (MPSC) is seeking consultation (as required in PA 233 Section 224.1b[1]) and determining the area of potential effects ("APE") for the proposed project. Federally listed sovereign Nations with an interest in the state of Michigan are invited to review and comment on Rouget Road Solar Farm, LLC's (Rouget Road Solar Farm) (a wholly-owned subsidiary of RWE Clean Energy LLC [RWE]) proposed **Rouget Road Solar Farm Project** (the "Project"). The proposed Project will require a state-siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC (PA 233 Section 226.7b). Although Rouget Road Solar Farm requests a review and comment on the Project, the MPSC is the state agency and may be communicated with directly.

Based on Michigan State Historic Preservation Office (MI SHPO) guidance from their *Instructions for the Application for PA 233 Renewable Energy Storage Facility Siting Consultation Form*:

> "**Public Act 233** requires the applicant for energy siting and storage facilities to consider and address impacts *to the environment and natural resources, including, but not limited to, sensitive habitats and waterways, wetlands and floodplains, wildlife corridors, parks,* ***historic and cultural sites****, and threatened or endangered species*. The applicant must submit this information to the Michigan Public Service Commission (MPSC) for consideration in permitting the project. In order to facilitate considerations of historic and cultural sites (hereafter Historic Properties), the MPSC has required applicants to consult with the State Historic Preservation Office (SHPO)."

This letter is part of the early coordination phase of the environmental review process, requesting comments associated with this Project. We are requesting comments from your area of expertise regarding any possible environmental or cultural effects associated with this Project. Please provide any additional information you may have regarding potential cultural resources in the Project area so they may be accounted for during the environmental review of this Project. This information can be provided directly to RWE or the MPSC.

Project Description

The proposed Project is southeast of the city of Adrian, in Palmyra Township, Lenawee County, Michigan (Figure 1). Historic Mapping places the proposed Project area in Sections 7, 8, 9, 15, 16, 17, 20, 21, 22, 27, 28, 29, 30, 33, and 34 of Township 7 South, Range 4 East as seen on the enclosed USGS 7.5 series for Tecumseh South and Palmyra, Michigan Topographic Quadrangle map (Figure 2). Rouget Road Solar Farm is proposing to construct a 175-megawatt (MW) alternating current (AC) solar photovoltaic power generating facility. The leased area/Project area boundary includes approximately 2,142 acres (867 hectares) (Figures 2 and 3). Construction will require 1,513 acres (612 ha) of what is currently primarily agricultural land (see site plan boundary in Figure 1). Limited tree removal is planned across 7.96 acres (3.22 ha). Proposed work required for the Project includes construction of a switchyard, substations, access

[1] Sections refer to those found at: https://www.legislature.mi.gov/documents/2023-2024/publicact/htm/2023-PA-0233.htm

roads, fencing, MV electrical cabling, and solar panel structures. Construction may also include an operations and maintenance building.

Project Permitting
The proposed Project will require a siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC.

PA 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 MW or more, to wind projects with a capacity of 100 MW or more, and energy storage facilities with a capacity of 50 MW or more. Projects that fall into these categories must identify and provide information on the effects of the Project on environmental, natural, and cultural resources. Additional PA 233 information is available online at State Project Reviews | MiPlace[2], and a Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the MPSC is available online at Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the Michigan Public Service Commission. [3]

Cultural Resource Investigations
The APE is the area in which the proposed Project may cause alterations in the character or use of historic resources. As the site plan boundary includes all locations that may be impacted by ground disturbing activities related to the project undertaking, it is considered the physical APE (see Figure 1). The visual APE for assessing visual effects to historic-age resources is a 0.5-mile buffer from the boundaries of the Project area (e.g., leased area/project boundary) (see Figure 2). This boundary will be modified based on visual intrusions that may obscure the project.

Rouget Road Solar Farm has contracted SWCA Environmental Consultants (SWCA) to conduct the archaeological and architectural history surveys. Due to the presence of previously--documented archaeology sites in and near the Project area, and the archaeological sensitivity for the River Raisin Valley, SWCA will conduct a full archaeological survey for the physical APE, including staging areas. The boundaries of [redacted], is mapped as lying within the proposed Project area; however, these site boundaries are mapped based off archival records and the extent of the complex is poorly understood. In order to be sensitive toward this [redacted], we are asking for your input on the extent of the complex and the survey methodologies that may be necessary beyond [redacted] An Unanticipated Discoveries Plan (Exhibit A-1.14 in the MPSC permit application) has been prepared.

Summary of Requested Action
We look forward to consulting with your office on this Project and to a continued dialogue. We ask that you provide any comments regarding the Project area following your review of the enclosure. Please use the above Project name and Project description in your reply.

In summary, the MPSC and Rouget Road Solar Farm are requesting Tribal Governments to:

[2] https://www.miplace.org/historic-preservation/programs-and-services/cultural-resource-management-and-planning/state-project-reviews/

[3] https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/consumer/MPSC_Tribal_Involvement_Guide.pdf?rev=399582a67fbe46e883e6f21d1325e785&hash=AA471378E81539AFBBA758AB04FB3D25

1. Review the Project information.
2. Identify cultural or environmental concerns.
3. Provide feedback on archaeological methodologies (especially near site 20LE28).
4. Ensure that any cultural resources are addressed in the MPSC permitting process.

All comments will be documented and considered in Project design and the forthcoming MPSC state siting process. Consultation with SHPO and the THPOs included in the distribution list below will be incorporated into the cultural survey plan, recordation, and design updates as needed. Your timely response will greatly help us incorporate your concerns into the development of the Project. For that purpose, we request that you provide comments by December 20, 2025.

Tribal consulting parties may respond to myself (Kevin Cole) at rougetroadsola@rwe.com with any comments or concerns. Alternatively, you can reach out directly to Gustavo Cordero at the MPSC at corderog@michigan.gov.

Respectfully,

Kevin Cole
RWE Development Manager
rougetroadsola@rwe.com

cc: Gustavo Cordero, Michigan Public Service Commission
Carol McKnight, SWCA Environmental Consultants
Anna Gilmer, SWCA Environmental Consultants

Distribution List:
Forest County Potawatomi Community, Wisconsin
Hannahville Indian Community, Michigan
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
Little Traverse Bay Bands of Odawa Indians, Michigan
Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan
Menominee Indian Tribe of Wisconsin
Miami Tribe of Oklahoma
Pokagon Band of Potawatomi Indians, Michigan and Indiana
Sault Ste. Marie Tribe of Chippewa Indians, Michigan
Seneca-Cayuga Nation

Enclosures:
1. Figures
    a. Figure 1: State location map
    b. Figure 2: Portions of the USGS 7.5' series Tecumseh South and Palmyra Michigan Topographic Quadrangles showing the Project area.
    c. Figure 3: Aerial view of the Project area location in Palmyra Township, Lenawee County, Michigan.
2. Cultural Desktop Report
3. SHPO PA233 Response

Figure 1. Location of the proposed Rouget Road Solar Project Area in Michigan.

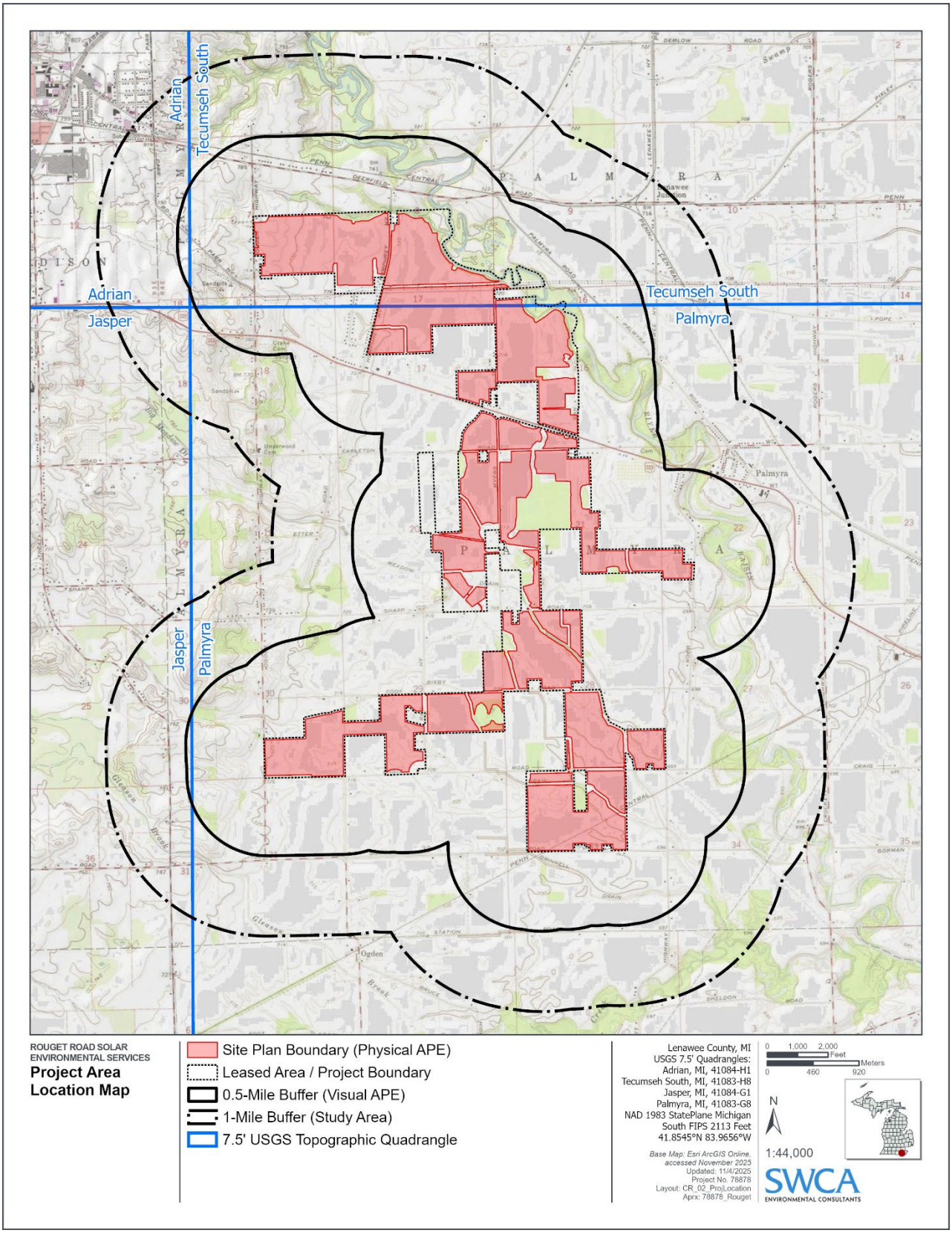

Figure 2. Portions of the USGS 7.5' series Tecumseh South and Palmyra, Michigan Topographic Quadrangles showing the site plan boundary and leased area/Project boundary.

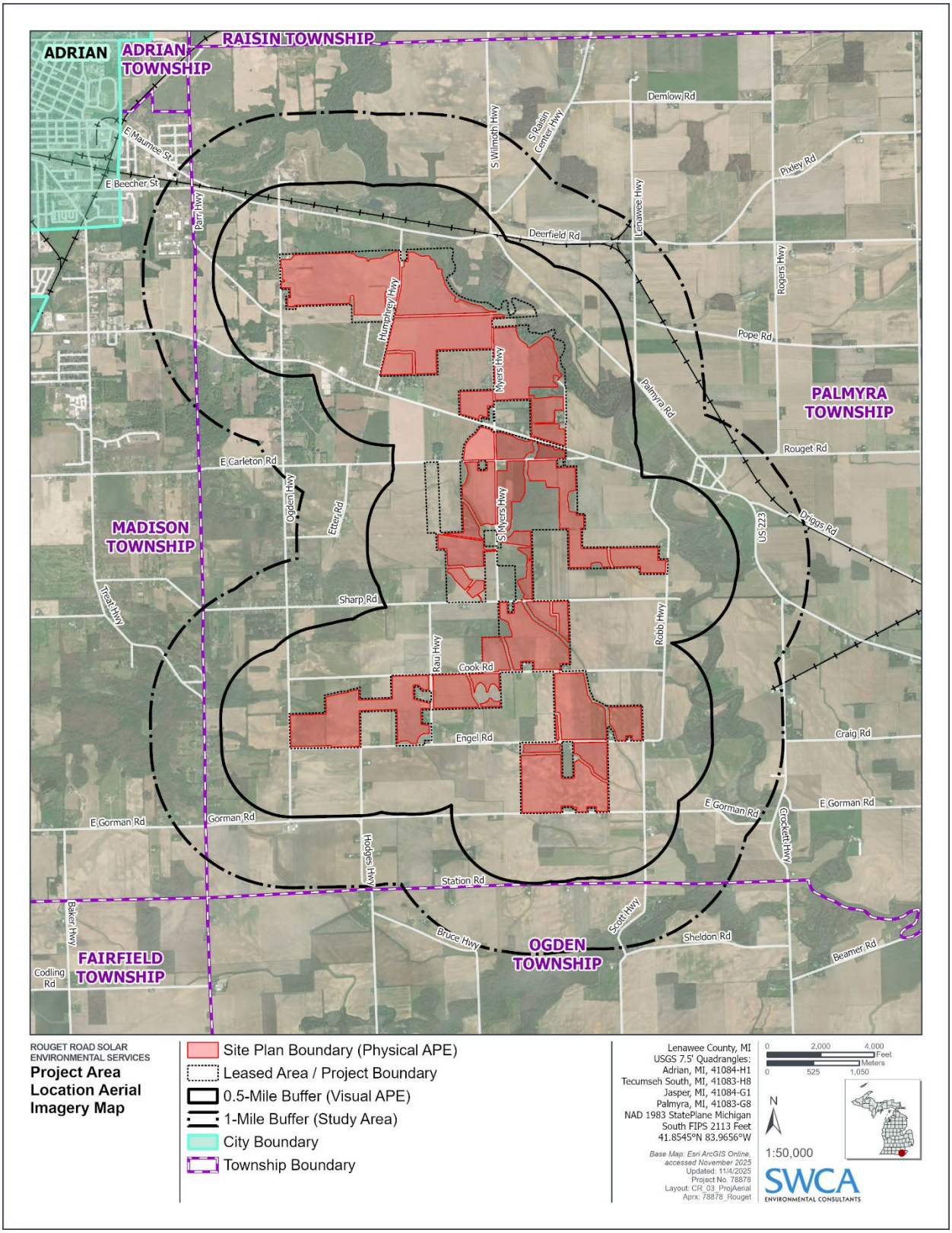

Figure 3. Aerial view showing the site plan boundary and leased area/Project boundary in Palmyra Township, Lenawee County, Michigan.

Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan

JANUARY 2025

PREPARED FOR

Rouget Road, LLC

PREPARED BY

SWCA Environmental Consultants

CULTURAL RESOURCES DESKTOP REVIEW FOR THE ROUGET ROAD, LLC LENAWEE COUNTY, MICHIGAN

Prepared for

Rouget Road, LLC
353 North Clark Street, 30th Floor
Chicago, Illinois 60654
Attn: J Kevin Cole

Prepared by

Rachel Lawrence, M.A., RPA
Heather MacIsaac, B.A.

and

Anna Gilmer, M.A., RPA

SWCA Environmental Consultants
200 22nd Street, Suite 220
Lombard, Illinois 60148
(630) 705-1762
www.swca.com

SWCA Project No. 78878

SWCA Cultural Resources Report No. 25-27

January 2025

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Appendix A. Figures

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Table 5. Previously Recorded Cemeteries in the Study Area 8

1 INTRODUCTION

SWCA Environmental Consultants (SWCA) completed a cultural resources desktop review for the proposed Rouget Road, LLC (project), located in Lenawee County, Michigan (Figure A-1 in Appendix A). The Project Area spans approximately 2,490 acres (1,008 hectares) of privately owned land near the towns of Adrian, Palmyra, and Ogden. SWCA completed the desktop review for the Project Area plus a surrounding 1.0-mile (1.6-kilometer) buffer around the Project Area. The surrounding 1.0-mile buffer is henceforth referred to as the Study Area (Figures A-2 and A-3).

The objective of the desktop review was to identify existing cultural resources within the Project Area and Study Area to inform project facility siting. Additionally, the Study Area was evaluated to gain an understanding of the type and density of cultural resources in the vicinity of the Project Area. This report summarizes the methods SWCA used to complete the desktop review and presents the results of the background research. It does not serve as Section 106 clearance for the proposed project.

2 REGULATORY FRAMEWORK

Projects in Michigan can come under the purview of two primary cultural resources regulations, the National Historic Preservation Act (NHPA) and Michigan's Natural Resources and Environmental Protection Act. Both are administered by the Michigan State Historic Preservation Office (MI SHPO).

If the project is deemed a federal undertaking (requiring a federal permit, license, or approval; being located on federally owned or managed land; or receiving federal financial assistance), a cultural resources survey most likely would be mandated to ensure compliance with Section 106 of the NHPA. The scope of required cultural resources surveys would then be determined by the functioning federal lead agency in cooperation with the MI SHPO and, if applicable, the pertinent Tribal Historic Preservation Offices as defined in both Section 101 of the National Environmental Policy Act and Section 106 of the NHPA.

Under Michigan law, the state oversees all archaeology performed on state land. The Natural Resources and Environmental Protection Act (Public Act 451 of 1994, Part 761) requires that a permit be obtained prior to undertaking any archaeological investigation on state land.

Public Act 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 megawatts or more, to wind projects with a capacity of 100 megawatts or more, and to energy storage facilities with a capacity of 50 megawatts or more. Public Act 233allows developers the option of applying to the Michigan Public Service Commission (MPSC) to construct utility-scale renewable energy facilities if the local unit of government does not have a compatible renewable energy ordinance. If a compatible renewable energy ordinance is in place, the developer must apply with the local unit of government first, but if the project is denied, the developer may submit to the MPSC for approval. Projects that fall into these categories must identify and provide information on the effects of the project on environmental, natural, and cultural resources.

The project will occur solely on privately held land; thus, no state or local laws requiring archaeological investigations or surveys are anticipated to apply for this project. However, Public Act 233 requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC.

3 METHODOLOGY

SWCA initially submitted a request for in-person research to the MI SHPO on April 7, 2023. Staff at the MI SHPO approved the request and scheduled a research appointment for April 20, 2023. An SWCA archaeologist obtained information in person on previous cultural resources surveys, previously recorded archaeological resources, and previously recorded postcontact architectural resources within the Study Area.

As the Project Area and Study Area were revised in fall 2024, SWCA submitted a second request to the MI SHPO for archaeology and survey site files within the revised Study Area. MI SHPO provided all available records on December 9, 2024. Due to the ongoing updates to the MI SHPO's database, a process that was initiated on February 24, 2024, only archaeology files are currently available. Postcontact architecture files and both postcontact architectural and archaeological survey reports are not currently available as the MI SHPO are scanning these files for upload into a new database. As such, SWCA relied on the April 2023 postcontact architectural resource files and survey reports for this review. SWCA additionally reviewed the National Register of Historic Places (NRHP) database for Michigan as the best available recent data regarding architectural resources.

In addition to the site file search, SWCA investigated historic plat and topographic maps and historic aerial imagery of the Project Area and Study Area. SWCA also researched environmental factors such as modern and historic land use and soil units mapped by the Natural Resources Conservation Service (NRCS) to determine the likelihood of the project to encounter previously unrecorded precontact or postcontact archaeological resources.

4 RESULTS

4.1 Physiography, Geology, and Soils

The Project Area is situated within the Erie-Huron Lake Plain of the Eastern Lake section of the Central Lowland province of the Interior Plains (NRCS 2022:343). The Erie-Huron Lake Plain is a fairly level glacial lake plain with scattered sandy ridges formed by former shorelines and moraines. Elevation ranges from approximately 570 to 815 feet (175 to 250 meters [m]), whereas local relief averages 10 feet (3 m). Major confluences in the Erie-Huron Lake Plain include the Clinton, Huron, and Saginaw Rivers, which empty into the Great Lakes. The Project Area is located within the Floodwood Creek-River Raisin watershed and the Big Meadow Drain-Black Creek watershed, which empty into the River Raisin (U.S. Environmental Protection Agency 2023). Mississippian- to Silurian-age limestone, shale, and dolomite are common along the surface and along the shores of Lake Erie and Lake Huron. Broad, level, and somewhat poorly drained lake plains feature American beech, sugar maple, silver maple, green ash, pin oak, swamp white oak, and American elm, whereas sandy areas feature eastern white pine, eastern hemlock, and other coniferous trees (NRCS 2022:344).

This ecoregion is also part of the Maumee Lake Plain and the Ann Arbor Moraines sub-subsections. The Maumee Lake Plain is a broad, flat, glaciated clay lake plain with rich, loamy soils deeply mantled by till and outwash and dissected by broad glacial drainageways containing sandy soils (Albert 1995). This region formerly included beech-sugar maple forest, elm-ash forest, deciduous swamps, white oak-black oak savannas, wet prairies, and coastal marshes, but now has been largely cultivated (Albert 1995; NRCS 2022). The Ann Arbor Moraines sub-subsection is a long, narrow band of fine- and medium-textured end and ground moraine bordered by flat lake plain on the east and by sandy outwash, end moraine, and ice-contact features to the west. This region formerly supported oak and oak-hickory forests, with oak

savannas along the western edge (Albert 1995). Major wildlife species in the Erie-Huron Lake Plain area include white-tailed deer; cottontail rabbits; squirrels; raccoons; pheasants; bobwhite quail; songbirds; various species of snakes, frogs, and turtles; sunfish; perch; bass; walleye; catfish; carp, sucker; and northern pike.

There are 40 soil series mapped within the Project Area by the NRCS (Table 1). The soils range from very poorly drained to excessively drained loams to sandy loams. The most common soils for the Project Area include Brady and Macomb loams, 0 to 3 percent slopes; Colwood very fine sandy loam, 0 to 3 percent slopes; Wauseon loam, 0 to 3 percent slopes; Ziegenfuss clay loam, 0 to 1 percent slopes; Brady and Macomb sandy loams, 0 to 3 percent slopes; and Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes. These soil types, and their implication for site formation processes and archaeological potential, are discussed further in Section 4.6.

Table 1. Soils within the Project Area

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
BbA	Berrien loamy sand, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BbB	Berrien loamy sand, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcA	Berrien sandy loam, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcB	Berrien sandy loam, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BhA	Brady sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on strand plains	Loamy over sandy and gravelly glaciofluvial deposits
BkA	Brady and Macomb loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BnA	Bronson sandy loam, 0 to 3 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BnB	Bronson sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BoA	Brookston loam, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
CbB	Cadmus sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over loamy till
CeA	Colwood very fine sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CgA	Conover loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Loamy till
GbA	Genesee sandy loam, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
GcA	Genesee and Eel loams, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GgA	Griffin and Sloan loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Clayey till
KbC	Kendallville sandy loam, 7 to 15 percent slopes	Well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over till
KeA	Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on deltas	Stratified loamy glaciofluvial deposits
LcA	Linwood muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Wood organic material over loamy till
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Drainageways on till-floored lake plains	Sandy and/or loamy glaciofluvial deposits over loamy till
NaA	Nappanee silt loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Clayey till
NbB	Nappanee loam, 3 to 7 percent slopes	Somewhat poorly drained	Knolls on ground moraines	Clayey till
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	Somewhat poorly drained	Knolls on ground moraines	Clayey till
OcC	Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded	Excessively drained	Beaches on till-floored lake plains	Glaciofluvial deposits and/or sandy glaciolacustrine deposits over loamy till
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	Poorly drained	Depressions on till plains	Loamy till
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PdB	Plainfield and Berrien loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PeB	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PwmaaA	Pewamo clay loam, dense substratum, 0 to 1 percent slopes	Poorly drained	Drainageways on nearshore zones (relict), flats on nearshore zones (relict)	Clayey till over dense till
RbA	Rollin muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Herbaceous organic material over marl
SbA	Sebewa sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on glacial drainage channels	Loamy over sandy and gravelly glaciofluvial deposits
Sf	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	Poorly drained	Drainageways on stream terraces, drainageways	Loamy drift over sandy and gravelly outwash
WcA	Wauseon loam, 0 to 3 percent slopes	Poorly drained	Depressions on till-floored lake plains	Glaciolacustrine deposits over clayey till

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	Poorly drained	Wave-worked till plains	Clayey till over loamy till
W	Water	N/A	N/A	N/A

Source: NRCS (2024).

4.2 Historical Land Use

SWCA reviewed historic plat and topographic maps, as these sources provide information on past land use within the Project Area and Study Area that may indicate the probability of encountering significant precontact and postcontact cultural resources in or near the Project Area. The historic maps indicate that there has been a general consistency in the road network and land-use patterns from the late nineteenth century into the modern era in the Study Area.

The earliest available map of the Project Area is an 1819 General Land Office survey map (Bureau of Land Management General Land Office 2024). The Project Area is uninhabited. The River Raisin is drawn as a winding water course east of the Project Area. There are patches of marshlands, and tributaries are marked but not fully drawn. No structures are depicted. Palmyra and Lenawee Junction have not yet been established.

The first available plat map, dated 1874, shows that the Project Area and Study Area had been divided into large landholdings. Residences, schools, and churches are depicted. Roads and three railroads also are in place, including the Lenawee County Railroad and Palmyra Road. The current U.S. Highway 233 is shown as a railroad. Several structures are depicted on landholdings within the Project Area. Some of these structures are adjacent to orchards or small agricultural fields. There are branches of unnamed tributaries flowing throughout the Project Area, one of which is the modern Big Meadow Drain (Everts and Stewart 1874).

By 1893, the Project Area is depicted similarly to the 1874 plat. More landowners have appeared, represented by smaller landholdings, and structures are depicted within the Project Area. The unnamed tributaries are still depicted, running through the central and southern portions of the Project Area (Cadwell 1893).

The 1916 plat map shows an increase in landowners once more as the communities of Lenawee Junction and Palmyra continue to grow. Structures also are depicted on these parcels in the Project Area and are shown mostly along roads. U.S. Highway 233 is depicted as the Toledo Western electric railroad. There is another railroad that runs north-south to the Toledo Western electric railroad, connecting from Adrian to Palmyra within the Project Area. This segment of rail had been a road on the 1874 and 1893 plat maps. Several tributaries also are shown within the Project Area (Ogle 1916).

The 1921 plat map does not show individual structures beyond churches and schools, neither of which are in the Project Area. Landowner names are given, and the road network and railroads appear in the same location as on previous plats (*Adrian Daily Telegram* 1921). The 1928 plat presents the same information (*Adrian Daily Telegram* 1928).

SWCA also reviewed historic topographic maps to determine the land use of the Project Area and Study Area. Four historic topographic maps from 1939 to 1972 show that there has been little development from the early twentieth century to the present (U.S. Geological Survey [USGS] 2024). On the earliest available topographic map (Blissfield, Michigan, 1939, 1958 edition), multiple structures are shown in the

Project Area along roadways. The tributaries shown on the plat maps are named and shown: Big Meadow Drain, Bixby Drain, and Grinnell Drain. The road network and railroads are also depicted. The 1941 Blissfield, Michigan, topographic map reveals a similar image. The 1972 Palmyra, Michigan, and 1972 Tecumseh South, Michigan, topographic quadrangles name most of the roads in the Project Area, and they show that residential development had not increased outside of Palmyra and Adrian. Transmission and telecommunication cables are also depicted (USGS 2024).

A review of 17 aerial photographs taken between 1955 and 2022 indicates that minimal land development occurred within the Project Area and its environs. On the aerial images beginning in 1955, the landscape is agricultural. Isolated farmsteads are visible along roadways outside of Palmyra, Lenawee Junction, and Adrian. Drainages are visible either as scars on the landscape or are lined with trees, as is the River Raisin. There are some stands of trees throughout the Project Area. Between 1955 and 2022, no noticeable changes occur to the land use in the Project Area or Study Area (Historic Aerials 2024).

4.3 Previous Cultural Resources Surveys

A review of MI SHPO records identified one cultural resources survey that was conducted in the Project Area and two cultural resources surveys conducted within the Study Area (Table 2). Project ER00-7.17.161134 was a reconnaissance investigation conducted in 2017 by Archaeological Consultants of Ossian. The survey area covered 0.44 acre of land, and no cultural resources were identified during the survey (Stillwell 2017). Project ER17-391 was conducted for the Howard Street/West Michigan CMAQ and Rehabilitation project; however, the MI SHPO records did not contain information on the surveyors, year, or report title. Project B17-258, identified on quad maps in the MI SHPO research repository as Lauterbur 2016, was a Phase I archaeological survey conducted in support of the replacement of the River Raisin Bridge in Palmyra, Michigan. The MI SHPO records did not include information on the extent of the survey; however, no archaeological sites were identified during the survey.

Table 2. Previous Cultural Resources Surveys in the Study Area

Project ID	Project Name	Survey Year	Surveyors	Report Title	Location
ER00-7.17.161134	G2 Cellular Tower Site Review #161134	2017	Archaeological Consultants of Ossian	*An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project #161134) in Palmyra, Lenawee Conty, Michigan. 17FR29Mi.*	Project Area
ER17-391	Howard Street/ West Michigan CMAQ and Rehabilitation	None recorded	None recorded	None recorded	Study Area
B17-258	Lauterbur 2016	2016	Michigan Department of Transportation	*Archaeological Investigations at US-223 River Raisin Bridge Replacement, Palmyra, Lenawee County.*	Study Area

4.4 Previously Recorded Archaeological Sites

[redacted]

[redacted]

4.5 Previously Recorded Architectural Resources and Cemeteries

SWCA reviewed the National Park Service's NRHP database for Lenawee County, Michigan, regarding information on historic districts, buildings, archaeological sites, and other properties eligible for or listed in the NRHP. The NRHP database did not identify any NRHP-listed resources within the Project Area (National Park Service 2024).

SWCA also reviewed historic architecture data provided by the MI SHPO in April 2023. No previously recorded architectural resources are located within the Project Area; three architectural resources are located in the Study Area (Table 4; Appendix A: Figure 5).

No recorded cemeteries are present in the Project Area; two postcontact cemeteries (Palmyra Village Cemetery and Crane Cemetery) are located within the Study Area (Table 5; Appendix A: Figure 5). Palmyra Village Cemetery was included in the MI SHPO site file data, while Crane Cemetery was identified through archival research of historic topographic maps. Due to the data gap in the MI SHPO site file records since February 2024, it is not clear if Crane Cemetery is still absent from MI SHPO site file records.

Table 4. Previously Recorded Historic Architectural Resources in the Study Area

Site ID	Historic Name	City	NRHP Status	Location
P23943	Palmyra Presbyterian Church	Palmyra	Unevaluated	Study Area
P61449	Bruce Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area
P61451	Scott Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area

Table 5. Previously Recorded Cemeteries in the Study Area

Historic Name	Record Source	Location
Palmyra Village Cemetery	MI SHPO site file data	Study Area
Crane Cemetery	Archival research	Study Area

4.6 Geoarchaeology

Geoarchaeology, which is a multidisciplinary field that incorporates topography, geomorphology, geology, and soils, helps archaeologists to understand how geological processes have influenced the preservation of archaeological sites. Research conducted by Monaghan and Lovis (2005) demonstrates that deeply buried soils have an increased probability of sustaining cultural resources where fluvial deposits overlie alluvial deposits as a result of waterways breaching their banks. Monaghan and Lovis developed a predictive geoarchaeological model that takes these effects into account and classifies an area's likelihood of having cultural resources from Low to High-Very High.

Based on the Monaghan and Lovis (2005) model, the Project Area intersects with areas modeled as having moderate to high potential for deeply buried archaeological deposits (Figure A-6). [redacted] Otherwise, the remainder of the Project Area is largely mapped as exhibiting a low potential for deeply buried archaeological deposits.

[redacted]

4.7 Cultural Resources Context and Potential

The potential of the Project Area to contain cultural resources was developed through examination of the natural and topographical characteristics of the Project Area and available historic-era maps and aerial photographs.

4.7.1 Potential for Precontact Archaeological Sites

[redacted]

4.7.2 Potential for Postcontact Archaeological Sites

[redacted]

5 SUMMARY AND RECOMMENDATIONS

In summary, the records review established that one cultural resources survey has been conducted previously within the Project Area, and two cultural resources surveys have been conducted in the Study Area. These compliance surveys were negative and did not result in the recordation of cultural resources within the Project Area or the Study Area. However, [redacted] None of the archaeological sites within the Project Area have been evaluated for listing in the NRHP. There are no previously recorded architectural resources within the Project Area and three architectural resources in the Study Area. Based on MI SHPO records and a review of the NRHP, there are no NRHP-listed resources located within the Project Area or Study Area.

There is an overall moderate probability for significant precontact archaeological sites and a low to moderate probability for significant postcontact archaeological sites within the Project Area. [redacted]

Should the project require archaeological survey, the geoarchaeological modeling (Monaghan and Lovis 2005) suggests that shovel testing and/or deep testing (e.g., auguring) may be necessary [redacted] Pedestrian survey is a viable survey methodology as long as alluvial soils are confined to the plow zone (e.g., 12 inches [30 centimeters]); the limits of shovel testing is typically 3 feet (1 m).

Based on the MPSC regulations and our communications with the MI SHPO (personal communication, Sarah Surface-Evans and Scott Slagor, January 30, 2025), SWCA recommends initiating consultation with the MI SHPO. SWCA understands that MI SHPO has initiated a new consultation process for projects subject to permitting through the MPSC, and that the MI SHPO will provide expert testimony regarding cultural resources to the MPSC. To initiate the consultation process, the MI SHPO requests developers to complete a consultation application, in coordination with a professional archaeologist and architectural historian, The MI SHPO will provide their recommendations for next steps, including survey and avoidance requirements. SWCA understands that RWE will have 1 year after submittal of the MPSC permit application to obtain the approval of survey reports or recommendations submitted to the SHPO.

In keeping with Public Act 233, which requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC, SWCA recommends this document be provided to the MPSC for review. Approval from the MPSC is required before development within the boundaries of these sites occurs.

6 REFERENCES CITED

Adrian Daily Telegram. 1921. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21190/Palmyra+Township/Lenawee+County+1921/Michigan/. Accessed November 14, 2024.

———. 1928. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/1610467/Palmyra+Township++Raisin+River/. Accessed November 14, 2024.

Albert, Dennis A. 1995. Regional landscape ecosystems of Michigan, Minnesota and Wisconsin: A working map and classification. General Technical Report NC-178. U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota. Available at: https://www.nrs.fs.usda.gov/pubs/gtr/other/gtr-nc178/index.html. Accessed November 1, 2024.

Bureau of Land Management General Land Office. 2024. Original Survey Plat, Township 7 North, Range 4 East, 3rd Principal Meridian. Available at: https://glorecords.blm.gov/details/survey/default.aspx?dm_id=27676&sid=usa5y3jo.a4o#surveyDetailsTabIndex=0. Accessed November 14, 2024.

Cadwell, George D. 1893. Atlas of Lenawee County, Michigan. Geo. D. Cadwell and Company, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21077/Palmyra+Township/Lenawee+County+1893/Michigan/. Accessed November 14, 2024.

Everts and Stewart. 1874. Combination Atlas Map of Lenawee County, Michigan. Everts and Stewart, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/20906/Palmyra+Township/. Accessed November 14, 2024.

Historic Aerials. 2024. Historic Aerials Viewer. Available at: https://www.historicaerials.com/viewer. Accessed November 14, 2024.

Monaghan, G. William, and William A. Lovis. 2005. *Modeling Archaeological Site Burial in Southern Michigan: A Geoarchaeological Synthesis*. Michigan State University Press, East Lansing.

National Park Service. 2024. National Register of Historic Places Database and Research. Available at: https://www.nps.gov/subjects/nationalregister/database-research.htm. Accessed January 13, 2025.

Natural Resources Conservation Service (NRCS). 2022. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. Washington, D.C.

———. 2024. Custom Soil Report. Available at: http://websoilsurvey.nrcs.usda.gov. Accessed December 12, 2024.

Ogle, George A. 1916. Standards Atlas of Lenawee County, Michigan. Geo. A. Ogle Publishers and Engravers, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/22243/Palmyra+Township/Lenawee+County+1916/Michigan/. Accessed November 14, 2024.

Stillwell, Larry N. 2017. *An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project No. 161134) in Palmyra, Lenawee County, Michigan*. Archaeological Consultants of Ossian. On file at the Michigan State Historic Preservation Office, Lansing, Michigan.

U.S. Environmental Protection Agency. 2023. How's My Waterway Viewer. Available at: https://mywaterway.epa.gov/. Accessed November 14, 2024.

U.S. Geological Survey (USGS). 2024. National Geologic Map Database Project TopoView. Available at: https://ngmdb.usgs.gov/topoview/viewer/#14/41.8731/-83.9695. Accessed November 14, 2024.

APPENDIX A

Figures

Figure A-1. Location of the proposed Rouget Road, LLC Area in Michigan.

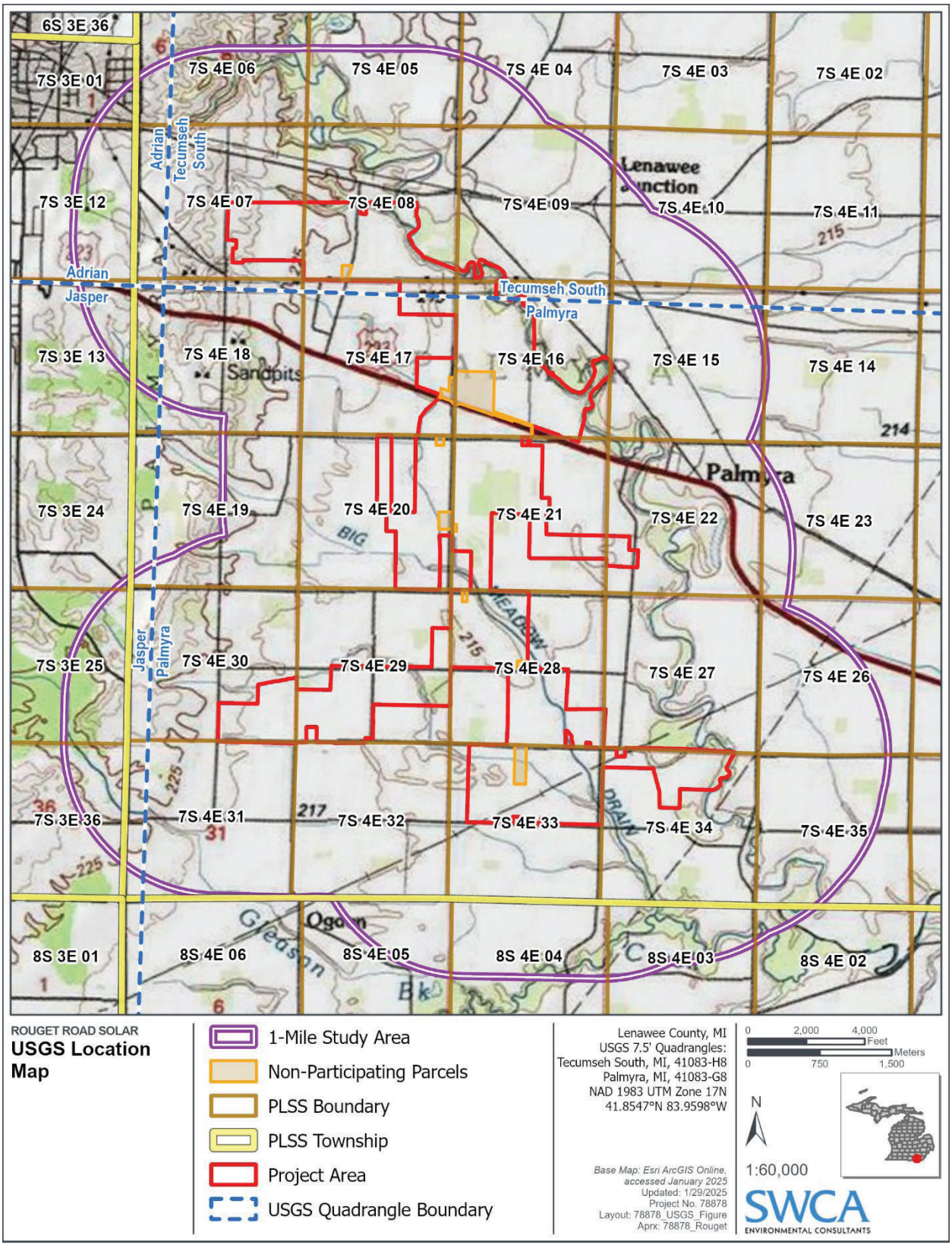

Figure A-2. Location of the Study Area for the proposed Rouget Road, LLC on a USGS topographic map.

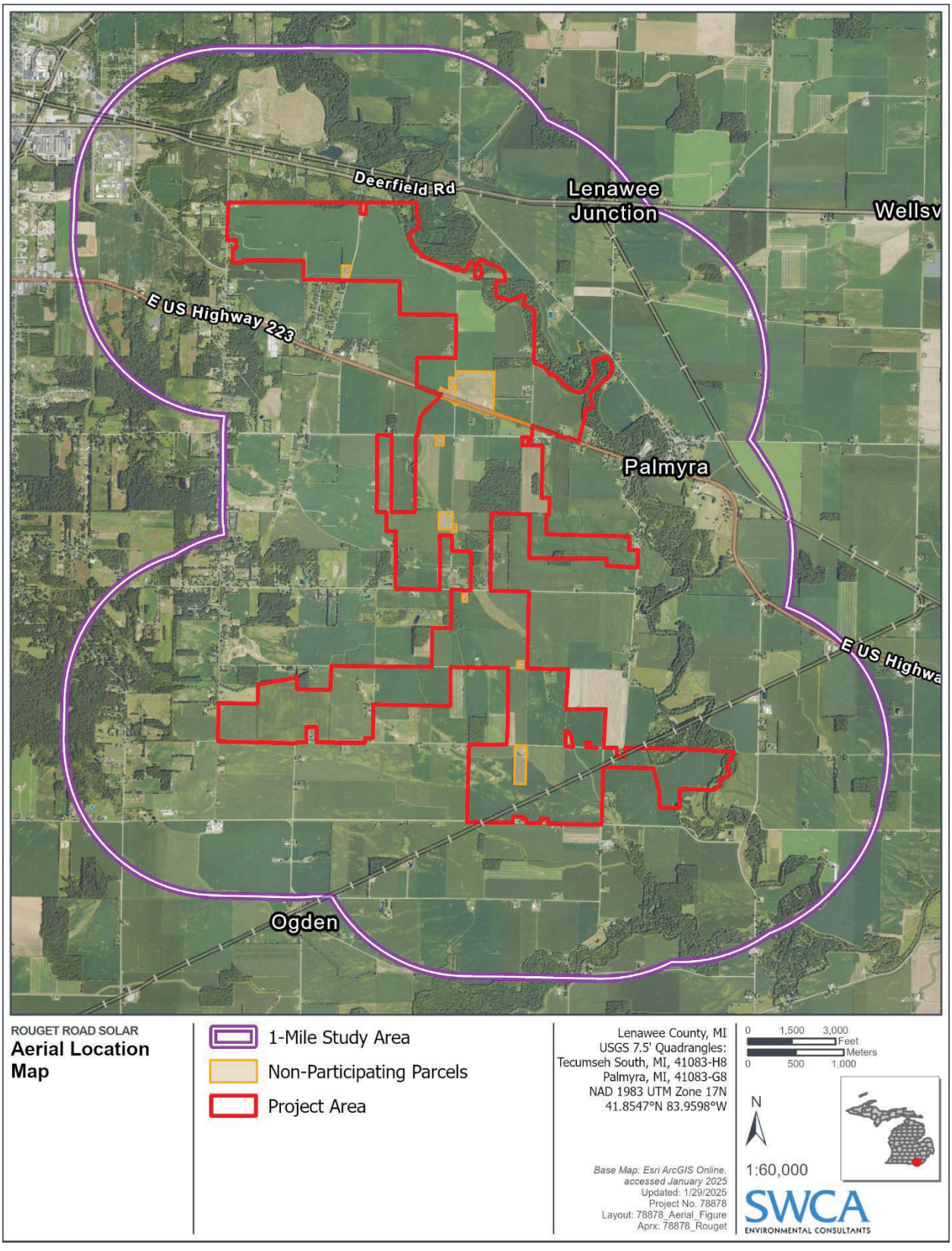

Figure A-3. Overview of the Study Area for the proposed Rouget Road, LLC on aerial imagery.

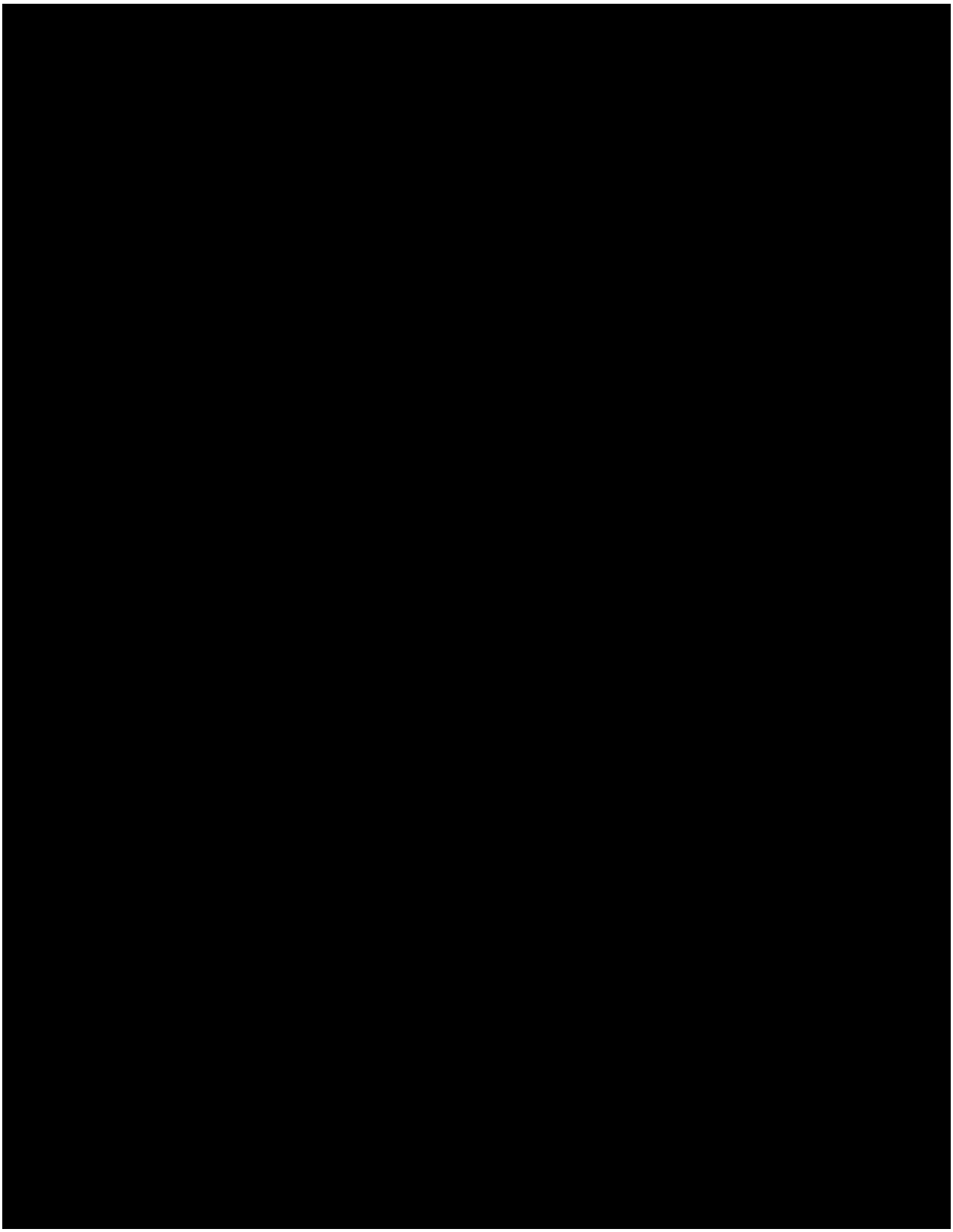

Figure A-4. Results of the background research for previously recorded cultural resources and previously conducted surveys.

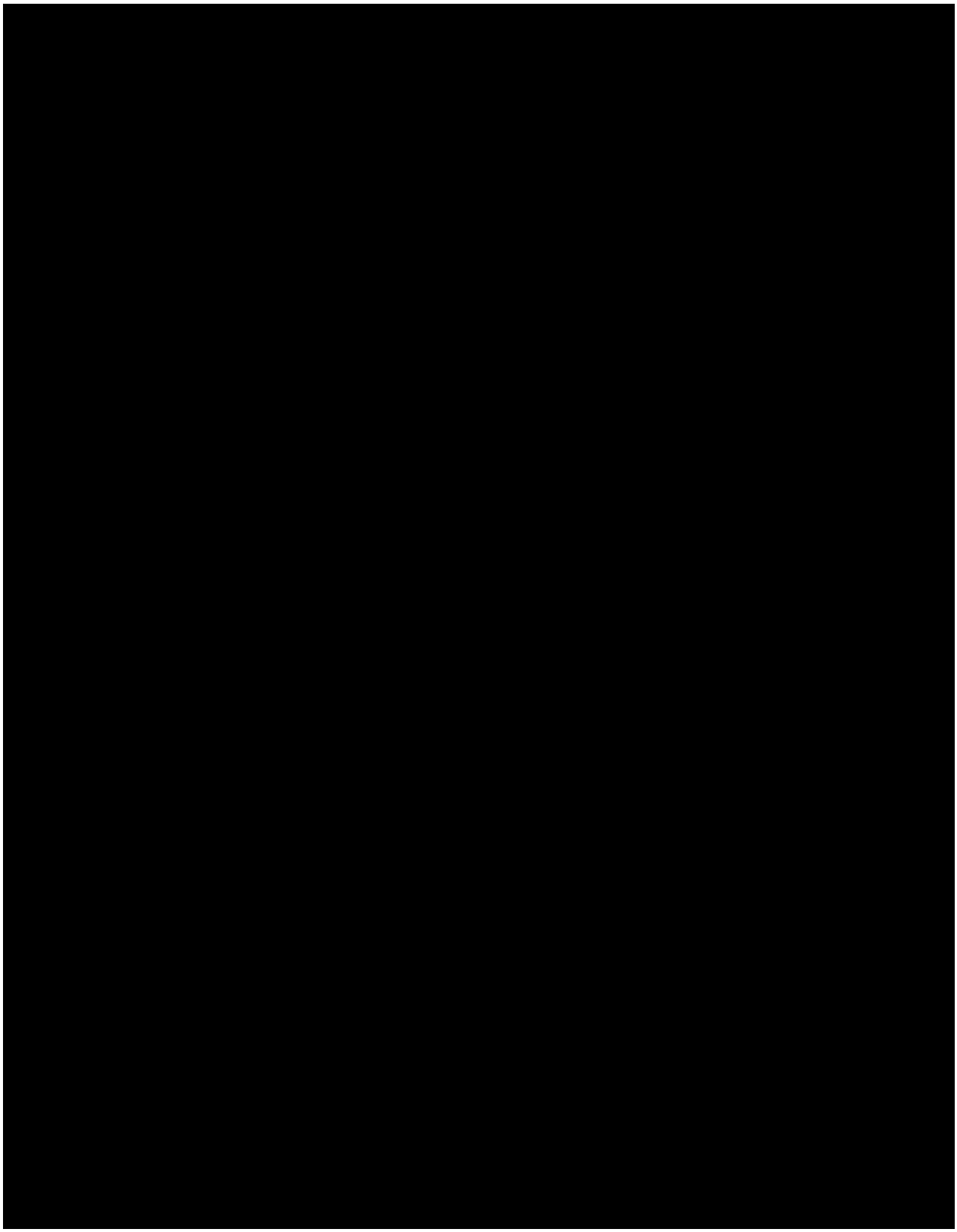

Figure A-5. Results of the background research for postcontact architectural resources and cemeteries.

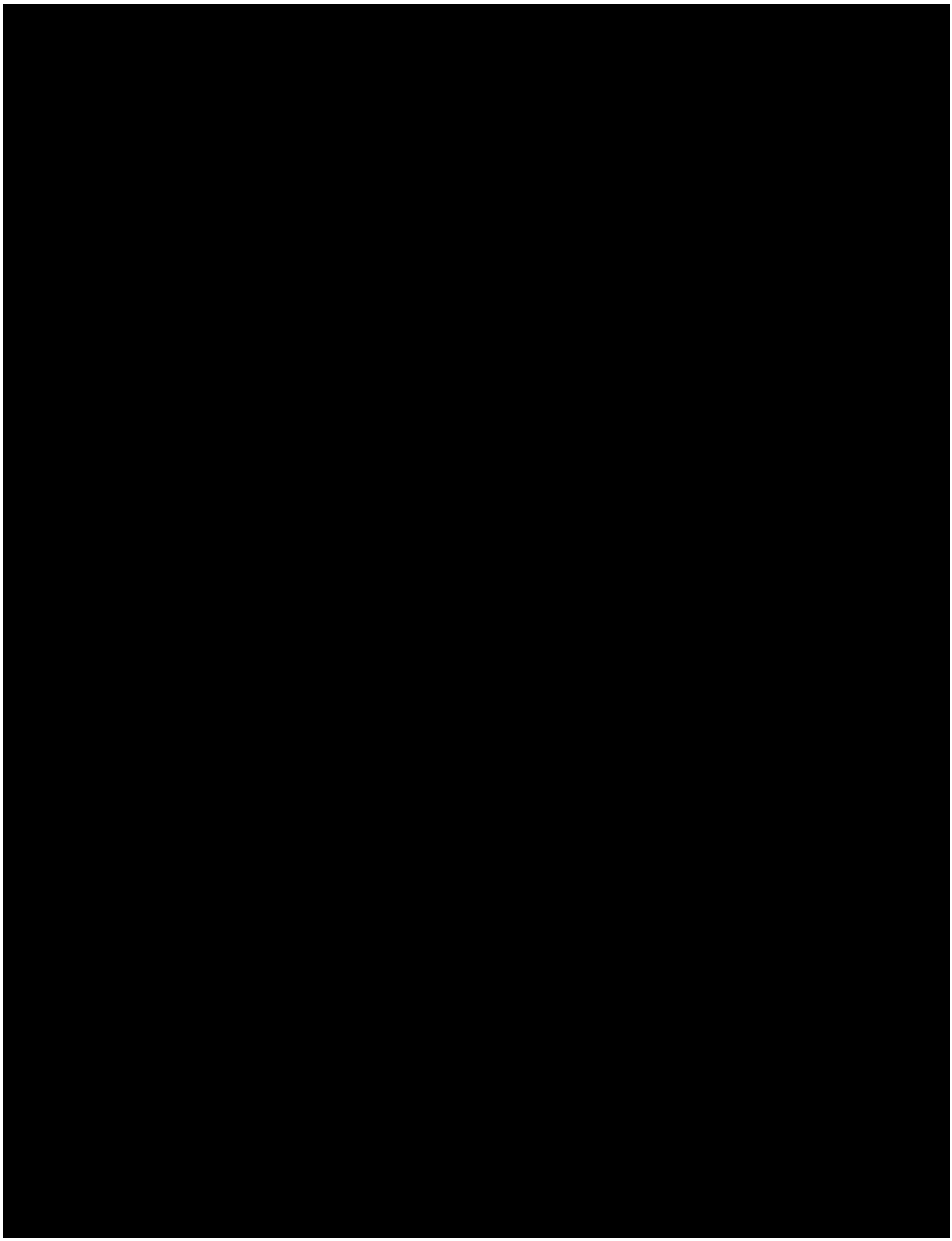

Figure A-6. Areas modeled as having moderate to high potential for deeply buried archaeological deposits in the Project Area and Study Area.

GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
MICHIGAN STRATEGIC FUND
STATE HISTORIC PRESERVATION OFFICE

QUENTIN L. MESSER, JR.
PRESIDENT

September 10, 2025

KEVIN COLE
ROUGET ROAD LLC
10250 PENLAWN DR.
JEROME, MI 49249

RE: SR25-23 PA233 Review Rouget Road, LLC Solar, T07S/R04E/Sec. 7, 8, 9, 15, 16, 17, 20 ,21, 22, 27, 28, 29, 30, 33, and 34, Palmyra Township, Lenawee County (MPSC)

Dear Mr. Cole:

We have received your request for review of the above-cited project under Public Act 233 of 2023 for Renewable Energy and Energy Storage Facility Siting (PA 233) at the above-noted location. We have reviewed the assessment prepared by SWCA, "Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan" and appreciate the information provided. To fully consider and address impacts to cultural and historic sites we require additional information, please send the following:

General

In the materials submitted, the project area boundaries in the submission form and in the Desktop Review do not match. Please ensure that we have the final project boundary maps included in all materials submitted to our office. Desktop Review states that the project plan will avoid archaeological sites, however, the project mapping provided does not make this apparent or clear. We cannot assess the impact of the proposed project on historic resources without accurate mapping information. Additionally, we would like to see the locations of staging areas, vehicle traffic, and any other areas that may have ground disturbance mapped.

Archaeological Resources

Due to the presence of previously documented sites within and near the project area, and the high archaeological sensitivity for the River Raisin valley generally, SHPO requests full archaeological survey for the entire project area, including staging areas. In particular, the boundaries of site 20LE28 are poorly delineated. In order to avoid this site, which is known to contain burials, additional survey methodologies may be necessary beyond pedestrian survey or shovel testing***. SHPO recommends consulting with our office and Tribal Nations with historic connections to this region to develop an appropriate methodology***, which may include geophysical prospection or historic human remains detection dog (HRD) survey. SHPO also recommends developing an Unanticipated Discovery Plan (UDP) for the project. A UDP specifies who will be contacted and what measures will be taken in the event of an unanticipated discovery of archaeological materials or human remains during the project implementation. Please see the UDP template attached, for an example of how these documents are organized. SHPO encourages the project proponent to work with consulting party tribes to develop an

appropriate UDP and protocol for handling human remains.

Above-ground Resources

SHPO concurs with the proposed methodology of utilizing the Above Ground Table in lieu of identification forms except that we require identification forms for properties that are identified as eligible. The table does not provide enough information for eligible properties. For eligible properties, photographs of all resources must also be included in an attachment with Architectural Properties Identification Form. When discussing effects to above-ground resources, please be sure to provide discussion of visual impacts as well as visual barriers in place that may play in to effects determinations. Also be sure that the Historic Resource Survey Report contains enough history and contextual information about the area and resources for SHPO to adequately assess eligibility.

Additional information must be submitted online through our Additional Information Portal.

Please note that our review cannot proceed until we are able to consider the information requested above. This letter is not concurrence. If you have any questions, please contact please contact Senior Archaeologist, Sarah Surface-Evans, surfaceevanss1@michigan.gov, (517) 282-7959 or Historian, Katlyn Burns Yancho, at 517-256-3416, burnsyanchok@michigan.gov. **Please reference our project number in all communication with this office regarding this review.** Thank you for your consultation.

Sincerely,

Sarah Surface-Evans, PhD, RPA
Senior Archaeologist

SES:KAK:KBY:SSE

Enclosure(s): UDP Template

Copy: Anna Gilmer, SWCA

Pokagon Band of Potawatomi Indians

From:	Jonathan Libbon
To:	"Matthew.Bussler@pokagonband-nsn.gov"
Cc:	Carol Mcknight; Aleyda Galan; Cole, J Kevin; Quarles, Mark; Anna Gilmer
Subject:	Rouget Road Solar Consultation Letter
Date:	Thursday, November 20, 2025 5:00:00 PM
Attachments:	Rouget Tribal Consulation LTR_20Nov2025.pdf image001.png
Sensitivity:	Private

Good Afternoon Matthew,

On behalf of Rouget Road Solar Farm LLC, a wholly-owned subsidiary of RWE Clean Energy LLC (RWE), we are reaching out to request your input on the Rouget Road Solar Farm Project, a proposed solar facility in Lenawee County, Michigan. The facility will require a state siting certificate from the Michigan Public Service Commission (MPSC). The attached letter and documentation outline the project and provide details on the cultural resource work completed to date. We are seeking comments from your area of expertise regarding any potential environmental or cultural effects associated with this project.

Please let me or Kevin Cole (cc'd), the project manager from RWE, know if you have any questions about the project.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

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11/20/2025

Dear Tribal Historic Preservation Officer and/or Tribal Cultural Representative,

As part of its responsibilities under Michigan Public Act 233 of 2023 (PA 233), *Renewable Energy and Energy Storage Facility Siting*, the Michigan Public Service Commission (MPSC) is seeking consultation (as required in PA 233 Section 224.1b[1]) and determining the area of potential effects ("APE") for the proposed project. Federally listed sovereign Nations with an interest in the state of Michigan are invited to review and comment on Rouget Road Solar Farm, LLC's (Rouget Road Solar Farm) (a wholly-owned subsidiary of RWE Clean Energy LLC [RWE]) proposed **Rouget Road Solar Farm Project** (the "Project"). The proposed Project will require a state-siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC (PA 233 Section 226.7b). Although Rouget Road Solar Farm requests a review and comment on the Project, the MPSC is the state agency and may be communicated with directly.

Based on Michigan State Historic Preservation Office (MI SHPO) guidance from their *Instructions for the Application for PA 233 Renewable Energy Storage Facility Siting Consultation Form*:

> "**Public Act 233** requires the applicant for energy siting and storage facilities to consider and address impacts *to the environment and natural resources, including, but not limited to, sensitive habitats and waterways, wetlands and floodplains, wildlife corridors, parks,* ***historic and cultural sites****, and threatened or endangered species*. The applicant must submit this information to the Michigan Public Service Commission (MPSC) for consideration in permitting the project. In order to facilitate considerations of historic and cultural sites (hereafter Historic Properties), the MPSC has required applicants to consult with the State Historic Preservation Office (SHPO)."

This letter is part of the early coordination phase of the environmental review process, requesting comments associated with this Project. We are requesting comments from your area of expertise regarding any possible environmental or cultural effects associated with this Project. Please provide any additional information you may have regarding potential cultural resources in the Project area so they may be accounted for during the environmental review of this Project. This information can be provided directly to RWE or the MPSC.

Project Description

The proposed Project is southeast of the city of Adrian, in Palmyra Township, Lenawee County, Michigan (Figure 1). Historic Mapping places the proposed Project area in Sections 7, 8, 9, 15, 16, 17, 20, 21, 22, 27, 28, 29, 30, 33, and 34 of Township 7 South, Range 4 East as seen on the enclosed USGS 7.5 series for Tecumseh South and Palmyra, Michigan Topographic Quadrangle map (Figure 2). Rouget Road Solar Farm is proposing to construct a 175-megawatt (MW) alternating current (AC) solar photovoltaic power generating facility. The leased area/Project area boundary includes approximately 2,142 acres (867 hectares) (Figures 2 and 3). Construction will require 1,513 acres (612 ha) of what is currently primarily agricultural land (see site plan boundary in Figure 1). Limited tree removal is planned across 7.96 acres (3.22 ha). Proposed work required for the Project includes construction of a switchyard, substations, access

[1] Sections refer to those found at: https://www.legislature.mi.gov/documents/2023-2024/publicact/htm/2023-PA-0233.htm

roads, fencing, MV electrical cabling, and solar panel structures. Construction may also include an operations and maintenance building.

Project Permitting
The proposed Project will require a siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC.

PA 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 MW or more, to wind projects with a capacity of 100 MW or more, and energy storage facilities with a capacity of 50 MW or more. Projects that fall into these categories must identify and provide information on the effects of the Project on environmental, natural, and cultural resources. Additional PA 233 information is available online at State Project Reviews | MiPlace[2], and a Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the MPSC is available online at Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the Michigan Public Service Commission. [3]

Cultural Resource Investigations
The APE is the area in which the proposed Project may cause alterations in the character or use of historic resources. As the site plan boundary includes all locations that may be impacted by ground disturbing activities related to the project undertaking, it is considered the physical APE (see Figure 1). The visual APE for assessing visual effects to historic-age resources is a 0.5-mile buffer from the boundaries of the Project area (e.g., leased area/project boundary) (see Figure 2). This boundary will be modified based on visual intrusions that may obscure the project.

Rouget Road Solar Farm has contracted SWCA Environmental Consultants (SWCA) to conduct the archaeological and architectural history surveys. Due to the presence of previously--documented archaeology sites in and near the Project area, and the archaeological sensitivity for the River Raisin Valley, SWCA will conduct a full archaeological survey for the physical APE, including staging areas. The boundaries of [redacted], is mapped as lying within the proposed Project area; however, these site boundaries are mapped based off archival records and the extent of the complex is poorly understood. In order to be sensitive toward this [redacted], we are asking for your input on the extent of the complex and the survey methodologies that may be necessary beyond [redacted] An Unanticipated Discoveries Plan (Exhibit A-1.14 in the MPSC permit application) has been prepared.

Summary of Requested Action
We look forward to consulting with your office on this Project and to a continued dialogue. We ask that you provide any comments regarding the Project area following your review of the enclosure. Please use the above Project name and Project description in your reply.

In summary, the MPSC and Rouget Road Solar Farm are requesting Tribal Governments to:

[2] https://www.miplace.org/historic-preservation/programs-and-services/cultural-resource-management-and-planning/state-project-reviews/

[3] https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/consumer/MPSC_Tribal_Involvement_Guide.pdf?rev=399582a67fbe46e883e6f21d1325e785&hash=AA471378E81539AFBBA758AB04FB3D25

1. Review the Project information.
2. Identify cultural or environmental concerns.
3. Provide feedback on archaeological methodologies (especially near site 20LE28).
4. Ensure that any cultural resources are addressed in the MPSC permitting process.

All comments will be documented and considered in Project design and the forthcoming MPSC state siting process. Consultation with SHPO and the THPOs included in the distribution list below will be incorporated into the cultural survey plan, recordation, and design updates as needed. Your timely response will greatly help us incorporate your concerns into the development of the Project. For that purpose, we request that you provide comments by December 20, 2025.

Tribal consulting parties may respond to myself (Kevin Cole) at rougetroadsola@rwe.com with any comments or concerns. Alternatively, you can reach out directly to Gustavo Cordero at the MPSC at corderog@michigan.gov.

Respectfully,

Kevin Cole
RWE Development Manager
rougetroadsola@rwe.com

cc: Gustavo Cordero, Michigan Public Service Commission
Carol McKnight, SWCA Environmental Consultants
Anna Gilmer, SWCA Environmental Consultants

Distribution List:
Forest County Potawatomi Community, Wisconsin
Hannahville Indian Community, Michigan
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
Little Traverse Bay Bands of Odawa Indians, Michigan
Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan
Menominee Indian Tribe of Wisconsin
Miami Tribe of Oklahoma
Pokagon Band of Potawatomi Indians, Michigan and Indiana
Sault Ste. Marie Tribe of Chippewa Indians, Michigan
Seneca-Cayuga Nation

Enclosures:
1. Figures
    a. Figure 1: State location map
    b. Figure 2: Portions of the USGS 7.5' series Tecumseh South and Palmyra Michigan Topographic Quadrangles showing the Project area.
    c. Figure 3: Aerial view of the Project area location in Palmyra Township, Lenawee County, Michigan.
2. Cultural Desktop Report
3. SHPO PA233 Response

Figure 1. Location of the proposed Rouget Road Solar Project Area in Michigan.

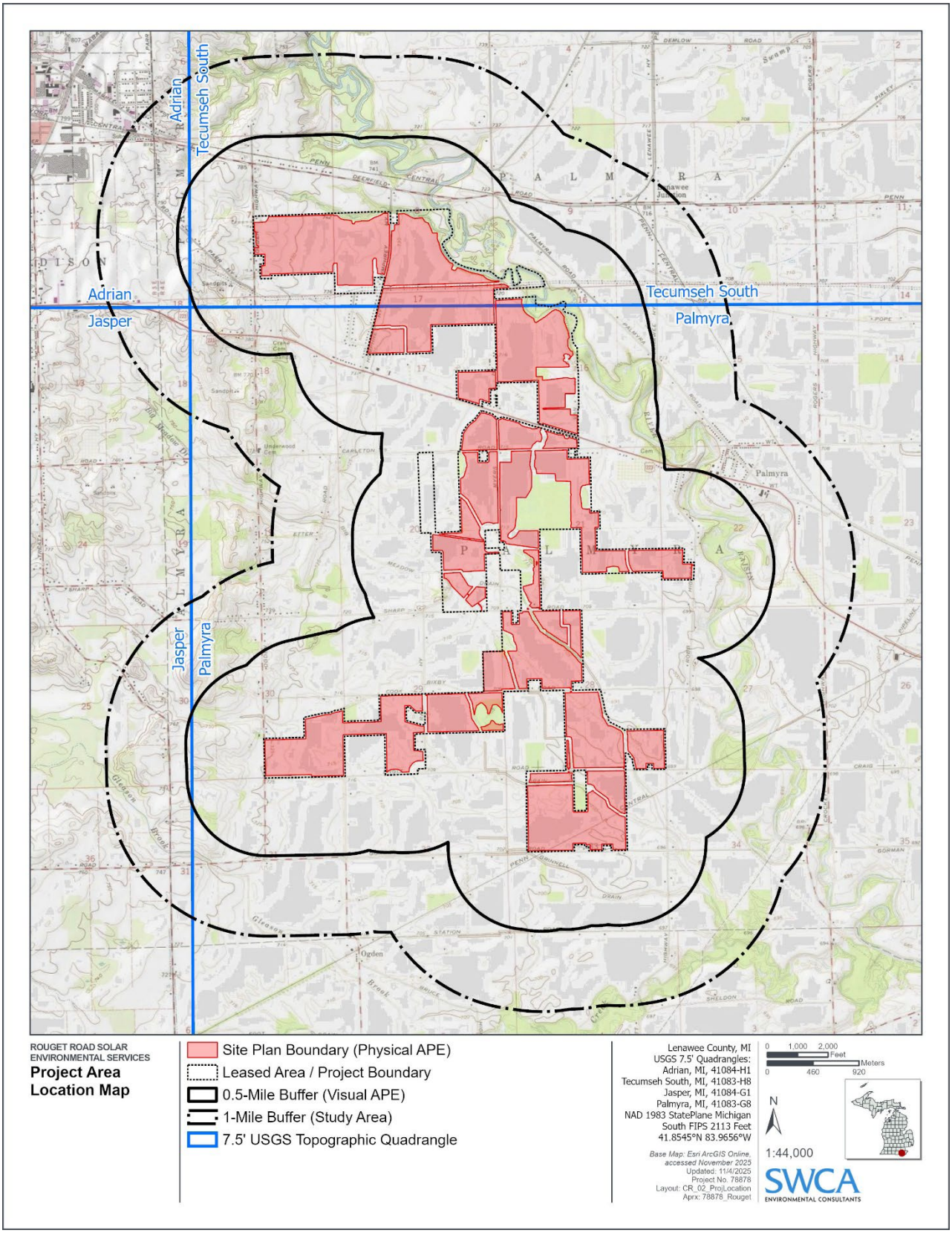

Figure 2. Portions of the USGS 7.5' series Tecumseh South and Palmyra, Michigan Topographic Quadrangles showing the site plan boundary and leased area/Project boundary.

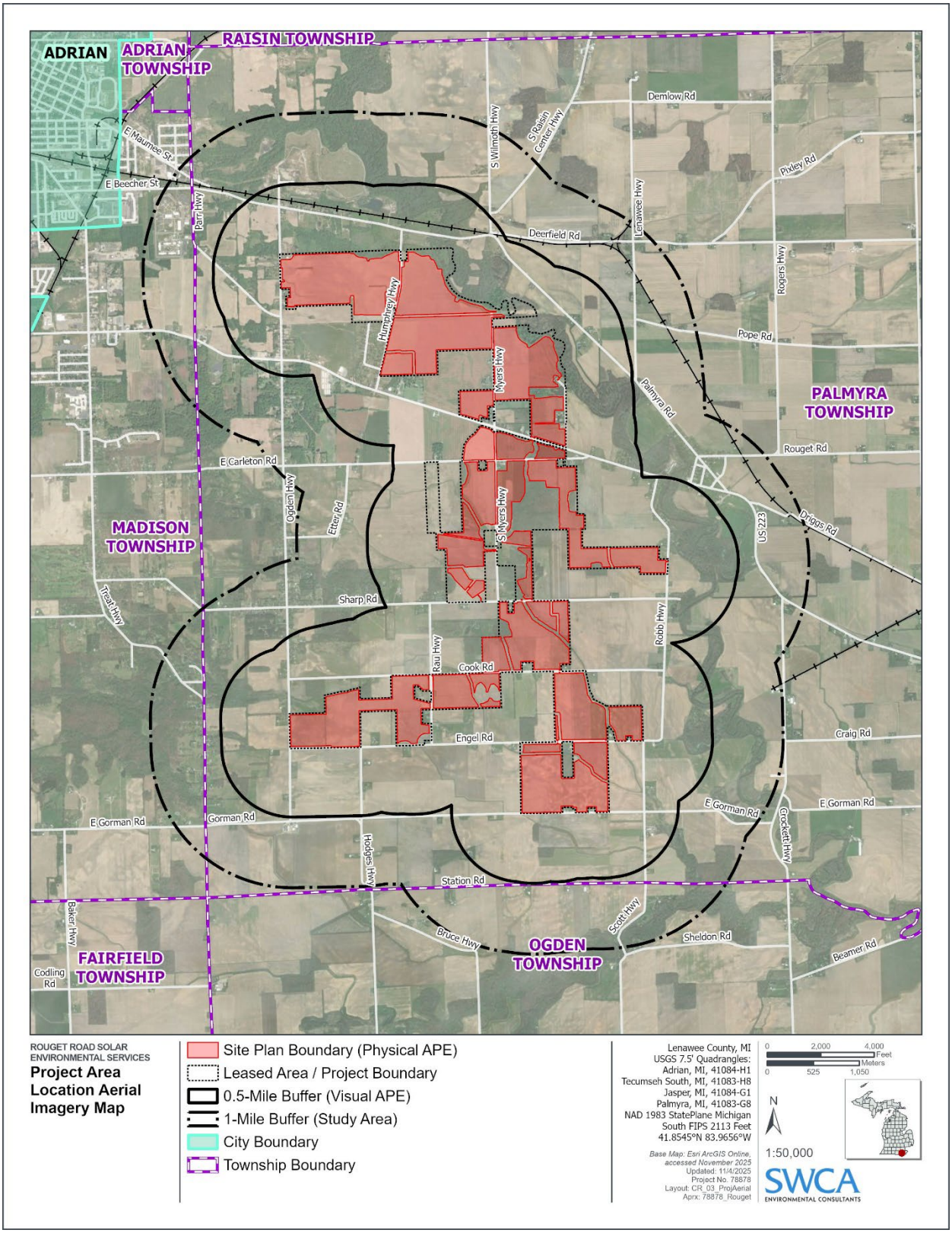

Figure 3. Aerial view showing the site plan boundary and leased area/Project boundary in Palmyra Township, Lenawee County, Michigan.

Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan

JANUARY 2025

PREPARED FOR

Rouget Road, LLC

PREPARED BY

SWCA Environmental Consultants

CULTURAL RESOURCES DESKTOP REVIEW FOR THE ROUGET ROAD, LLC LENAWEE COUNTY, MICHIGAN

Prepared for

Rouget Road, LLC
353 North Clark Street, 30th Floor
Chicago, Illinois 60654
Attn: J Kevin Cole

Prepared by

Rachel Lawrence, M.A., RPA
Heather MacIsaac, B.A.

and

Anna Gilmer, M.A., RPA

SWCA Environmental Consultants
200 22nd Street, Suite 220
Lombard, Illinois 60148
(630) 705-1762
www.swca.com

SWCA Project No. 78878

SWCA Cultural Resources Report No. 25-27

January 2025

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1 INTRODUCTION

SWCA Environmental Consultants (SWCA) completed a cultural resources desktop review for the proposed Rouget Road, LLC (project), located in Lenawee County, Michigan (Figure A-1 in Appendix A). The Project Area spans approximately 2,490 acres (1,008 hectares) of privately owned land near the towns of Adrian, Palmyra, and Ogden. SWCA completed the desktop review for the Project Area plus a surrounding 1.0-mile (1.6-kilometer) buffer around the Project Area. The surrounding 1.0-mile buffer is henceforth referred to as the Study Area (Figures A-2 and A-3).

The objective of the desktop review was to identify existing cultural resources within the Project Area and Study Area to inform project facility siting. Additionally, the Study Area was evaluated to gain an understanding of the type and density of cultural resources in the vicinity of the Project Area. This report summarizes the methods SWCA used to complete the desktop review and presents the results of the background research. It does not serve as Section 106 clearance for the proposed project.

2 REGULATORY FRAMEWORK

Projects in Michigan can come under the purview of two primary cultural resources regulations, the National Historic Preservation Act (NHPA) and Michigan's Natural Resources and Environmental Protection Act. Both are administered by the Michigan State Historic Preservation Office (MI SHPO).

If the project is deemed a federal undertaking (requiring a federal permit, license, or approval; being located on federally owned or managed land; or receiving federal financial assistance), a cultural resources survey most likely would be mandated to ensure compliance with Section 106 of the NHPA. The scope of required cultural resources surveys would then be determined by the functioning federal lead agency in cooperation with the MI SHPO and, if applicable, the pertinent Tribal Historic Preservation Offices as defined in both Section 101 of the National Environmental Policy Act and Section 106 of the NHPA.

Under Michigan law, the state oversees all archaeology performed on state land. The Natural Resources and Environmental Protection Act (Public Act 451 of 1994, Part 761) requires that a permit be obtained prior to undertaking any archaeological investigation on state land.

Public Act 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 megawatts or more, to wind projects with a capacity of 100 megawatts or more, and to energy storage facilities with a capacity of 50 megawatts or more. Public Act 233allows developers the option of applying to the Michigan Public Service Commission (MPSC) to construct utility-scale renewable energy facilities if the local unit of government does not have a compatible renewable energy ordinance. If a compatible renewable energy ordinance is in place, the developer must apply with the local unit of government first, but if the project is denied, the developer may submit to the MPSC for approval. Projects that fall into these categories must identify and provide information on the effects of the project on environmental, natural, and cultural resources.

The project will occur solely on privately held land; thus, no state or local laws requiring archaeological investigations or surveys are anticipated to apply for this project. However, Public Act 233 requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC.

3 METHODOLOGY

SWCA initially submitted a request for in-person research to the MI SHPO on April 7, 2023. Staff at the MI SHPO approved the request and scheduled a research appointment for April 20, 2023. An SWCA archaeologist obtained information in person on previous cultural resources surveys, previously recorded archaeological resources, and previously recorded postcontact architectural resources within the Study Area.

As the Project Area and Study Area were revised in fall 2024, SWCA submitted a second request to the MI SHPO for archaeology and survey site files within the revised Study Area. MI SHPO provided all available records on December 9, 2024. Due to the ongoing updates to the MI SHPO's database, a process that was initiated on February 24, 2024, only archaeology files are currently available. Postcontact architecture files and both postcontact architectural and archaeological survey reports are not currently available as the MI SHPO are scanning these files for upload into a new database. As such, SWCA relied on the April 2023 postcontact architectural resource files and survey reports for this review. SWCA additionally reviewed the National Register of Historic Places (NRHP) database for Michigan as the best available recent data regarding architectural resources.

In addition to the site file search, SWCA investigated historic plat and topographic maps and historic aerial imagery of the Project Area and Study Area. SWCA also researched environmental factors such as modern and historic land use and soil units mapped by the Natural Resources Conservation Service (NRCS) to determine the likelihood of the project to encounter previously unrecorded precontact or postcontact archaeological resources.

4 RESULTS

4.1 Physiography, Geology, and Soils

The Project Area is situated within the Erie-Huron Lake Plain of the Eastern Lake section of the Central Lowland province of the Interior Plains (NRCS 2022:343). The Erie-Huron Lake Plain is a fairly level glacial lake plain with scattered sandy ridges formed by former shorelines and moraines. Elevation ranges from approximately 570 to 815 feet (175 to 250 meters [m]), whereas local relief averages 10 feet (3 m). Major confluences in the Erie-Huron Lake Plain include the Clinton, Huron, and Saginaw Rivers, which empty into the Great Lakes. The Project Area is located within the Floodwood Creek-River Raisin watershed and the Big Meadow Drain-Black Creek watershed, which empty into the River Raisin (U.S. Environmental Protection Agency 2023). Mississippian- to Silurian-age limestone, shale, and dolomite are common along the surface and along the shores of Lake Erie and Lake Huron. Broad, level, and somewhat poorly drained lake plains feature American beech, sugar maple, silver maple, green ash, pin oak, swamp white oak, and American elm, whereas sandy areas feature eastern white pine, eastern hemlock, and other coniferous trees (NRCS 2022:344).

This ecoregion is also part of the Maumee Lake Plain and the Ann Arbor Moraines sub-subsections. The Maumee Lake Plain is a broad, flat, glaciated clay lake plain with rich, loamy soils deeply mantled by till and outwash and dissected by broad glacial drainageways containing sandy soils (Albert 1995). This region formerly included beech-sugar maple forest, elm-ash forest, deciduous swamps, white oak-black oak savannas, wet prairies, and coastal marshes, but now has been largely cultivated (Albert 1995; NRCS 2022). The Ann Arbor Moraines sub-subsection is a long, narrow band of fine- and medium-textured end and ground moraine bordered by flat lake plain on the east and by sandy outwash, end moraine, and ice-contact features to the west. This region formerly supported oak and oak-hickory forests, with oak

savannas along the western edge (Albert 1995). Major wildlife species in the Erie-Huron Lake Plain area include white-tailed deer; cottontail rabbits; squirrels; raccoons; pheasants; bobwhite quail; songbirds; various species of snakes, frogs, and turtles; sunfish; perch; bass; walleye; catfish; carp, sucker; and northern pike.

There are 40 soil series mapped within the Project Area by the NRCS (Table 1). The soils range from very poorly drained to excessively drained loams to sandy loams. The most common soils for the Project Area include Brady and Macomb loams, 0 to 3 percent slopes; Colwood very fine sandy loam, 0 to 3 percent slopes; Wauseon loam, 0 to 3 percent slopes; Ziegenfuss clay loam, 0 to 1 percent slopes; Brady and Macomb sandy loams, 0 to 3 percent slopes; and Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes. These soil types, and their implication for site formation processes and archaeological potential, are discussed further in Section 4.6.

Table 1. Soils within the Project Area

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
BbA	Berrien loamy sand, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BbB	Berrien loamy sand, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcA	Berrien sandy loam, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcB	Berrien sandy loam, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BhA	Brady sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on strand plains	Loamy over sandy and gravelly glaciofluvial deposits
BkA	Brady and Macomb loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BnA	Bronson sandy loam, 0 to 3 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BnB	Bronson sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BoA	Brookston loam, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
CbB	Cadmus sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over loamy till
CeA	Colwood very fine sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CgA	Conover loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Loamy till
GbA	Genesee sandy loam, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
GcA	Genesee and Eel loams, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GgA	Griffin and Sloan loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Clayey till
KbC	Kendallville sandy loam, 7 to 15 percent slopes	Well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over till
KeA	Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on deltas	Stratified loamy glaciofluvial deposits
LcA	Linwood muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Wood organic material over loamy till
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Drainageways on till-floored lake plains	Sandy and/or loamy glaciofluvial deposits over loamy till
NaA	Nappanee silt loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Clayey till
NbB	Nappanee loam, 3 to 7 percent slopes	Somewhat poorly drained	Knolls on ground moraines	Clayey till
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	Somewhat poorly drained	Knolls on ground moraines	Clayey till
OcC	Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded	Excessively drained	Beaches on till-floored lake plains	Glaciofluvial deposits and/or sandy glaciolacustrine deposits over loamy till
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	Poorly drained	Depressions on till plains	Loamy till
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PdB	Plainfield and Berrien loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PeB	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PwmaaA	Pewamo clay loam, dense substratum, 0 to 1 percent slopes	Poorly drained	Drainageways on nearshore zones (relict), flats on nearshore zones (relict)	Clayey till over dense till
RbA	Rollin muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Herbaceous organic material over marl
SbA	Sebewa sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on glacial drainage channels	Loamy over sandy and gravelly glaciofluvial deposits
Sf	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	Poorly drained	Drainageways on stream terraces, drainageways	Loamy drift over sandy and gravelly outwash
WcA	Wauseon loam, 0 to 3 percent slopes	Poorly drained	Depressions on till-floored lake plains	Glaciolacustrine deposits over clayey till

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	Poorly drained	Wave-worked till plains	Clayey till over loamy till
W	Water	N/A	N/A	N/A

Source: NRCS (2024).

4.2 Historical Land Use

SWCA reviewed historic plat and topographic maps, as these sources provide information on past land use within the Project Area and Study Area that may indicate the probability of encountering significant precontact and postcontact cultural resources in or near the Project Area. The historic maps indicate that there has been a general consistency in the road network and land-use patterns from the late nineteenth century into the modern era in the Study Area.

The earliest available map of the Project Area is an 1819 General Land Office survey map (Bureau of Land Management General Land Office 2024). The Project Area is uninhabited. The River Raisin is drawn as a winding water course east of the Project Area. There are patches of marshlands, and tributaries are marked but not fully drawn. No structures are depicted. Palmyra and Lenawee Junction have not yet been established.

The first available plat map, dated 1874, shows that the Project Area and Study Area had been divided into large landholdings. Residences, schools, and churches are depicted. Roads and three railroads also are in place, including the Lenawee County Railroad and Palmyra Road. The current U.S. Highway 233 is shown as a railroad. Several structures are depicted on landholdings within the Project Area. Some of these structures are adjacent to orchards or small agricultural fields. There are branches of unnamed tributaries flowing throughout the Project Area, one of which is the modern Big Meadow Drain (Everts and Stewart 1874).

By 1893, the Project Area is depicted similarly to the 1874 plat. More landowners have appeared, represented by smaller landholdings, and structures are depicted within the Project Area. The unnamed tributaries are still depicted, running through the central and southern portions of the Project Area (Cadwell 1893).

The 1916 plat map shows an increase in landowners once more as the communities of Lenawee Junction and Palmyra continue to grow. Structures also are depicted on these parcels in the Project Area and are shown mostly along roads. U.S. Highway 233 is depicted as the Toledo Western electric railroad. There is another railroad that runs north-south to the Toledo Western electric railroad, connecting from Adrian to Palmyra within the Project Area. This segment of rail had been a road on the 1874 and 1893 plat maps. Several tributaries also are shown within the Project Area (Ogle 1916).

The 1921 plat map does not show individual structures beyond churches and schools, neither of which are in the Project Area. Landowner names are given, and the road network and railroads appear in the same location as on previous plats (*Adrian Daily Telegram* 1921). The 1928 plat presents the same information (*Adrian Daily Telegram* 1928).

SWCA also reviewed historic topographic maps to determine the land use of the Project Area and Study Area. Four historic topographic maps from 1939 to 1972 show that there has been little development from the early twentieth century to the present (U.S. Geological Survey [USGS] 2024). On the earliest available topographic map (Blissfield, Michigan, 1939, 1958 edition), multiple structures are shown in the

Project Area along roadways. The tributaries shown on the plat maps are named and shown: Big Meadow Drain, Bixby Drain, and Grinnell Drain. The road network and railroads are also depicted. The 1941 Blissfield, Michigan, topographic map reveals a similar image. The 1972 Palmyra, Michigan, and 1972 Tecumseh South, Michigan, topographic quadrangles name most of the roads in the Project Area, and they show that residential development had not increased outside of Palmyra and Adrian. Transmission and telecommunication cables are also depicted (USGS 2024).

A review of 17 aerial photographs taken between 1955 and 2022 indicates that minimal land development occurred within the Project Area and its environs. On the aerial images beginning in 1955, the landscape is agricultural. Isolated farmsteads are visible along roadways outside of Palmyra, Lenawee Junction, and Adrian. Drainages are visible either as scars on the landscape or are lined with trees, as is the River Raisin. There are some stands of trees throughout the Project Area. Between 1955 and 2022, no noticeable changes occur to the land use in the Project Area or Study Area (Historic Aerials 2024).

4.3 Previous Cultural Resources Surveys

A review of MI SHPO records identified one cultural resources survey that was conducted in the Project Area and two cultural resources surveys conducted within the Study Area (Table 2). Project ER00-7.17.161134 was a reconnaissance investigation conducted in 2017 by Archaeological Consultants of Ossian. The survey area covered 0.44 acre of land, and no cultural resources were identified during the survey (Stillwell 2017). Project ER17-391 was conducted for the Howard Street/West Michigan CMAQ and Rehabilitation project; however, the MI SHPO records did not contain information on the surveyors, year, or report title. Project B17-258, identified on quad maps in the MI SHPO research repository as Lauterbur 2016, was a Phase I archaeological survey conducted in support of the replacement of the River Raisin Bridge in Palmyra, Michigan. The MI SHPO records did not include information on the extent of the survey; however, no archaeological sites were identified during the survey.

Table 2. Previous Cultural Resources Surveys in the Study Area

Project ID	Project Name	Survey Year	Surveyors	Report Title	Location
ER00-7.17.161134	G2 Cellular Tower Site Review #161134	2017	Archaeological Consultants of Ossian	*An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project #161134) in Palmyra, Lenawee Conty, Michigan. 17FR29Mi.*	Project Area
ER17-391	Howard Street/ West Michigan CMAQ and Rehabilitation	None recorded	None recorded	None recorded	Study Area
B17-258	Lauterbur 2016	2016	Michigan Department of Transportation	*Archaeological Investigations at US-223 River Raisin Bridge Replacement, Palmyra, Lenawee County.*	Study Area

4.4 Previously Recorded Archaeological Sites

[redacted]

[redacted]

4.5 Previously Recorded Architectural Resources and Cemeteries

SWCA reviewed the National Park Service's NRHP database for Lenawee County, Michigan, regarding information on historic districts, buildings, archaeological sites, and other properties eligible for or listed in the NRHP. The NRHP database did not identify any NRHP-listed resources within the Project Area (National Park Service 2024).

SWCA also reviewed historic architecture data provided by the MI SHPO in April 2023. No previously recorded architectural resources are located within the Project Area; three architectural resources are located in the Study Area (Table 4; Appendix A: Figure 5).

No recorded cemeteries are present in the Project Area; two postcontact cemeteries (Palmyra Village Cemetery and Crane Cemetery) are located within the Study Area (Table 5; Appendix A: Figure 5). Palmyra Village Cemetery was included in the MI SHPO site file data, while Crane Cemetery was identified through archival research of historic topographic maps. Due to the data gap in the MI SHPO site file records since February 2024, it is not clear if Crane Cemetery is still absent from MI SHPO site file records.

Table 4. Previously Recorded Historic Architectural Resources in the Study Area

Site ID	Historic Name	City	NRHP Status	Location
P23943	Palmyra Presbyterian Church	Palmyra	Unevaluated	Study Area
P61449	Bruce Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area
P61451	Scott Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area

Table 5. Previously Recorded Cemeteries in the Study Area

Historic Name	Record Source	Location
Palmyra Village Cemetery	MI SHPO site file data	Study Area
Crane Cemetery	Archival research	Study Area

4.6 Geoarchaeology

Geoarchaeology, which is a multidisciplinary field that incorporates topography, geomorphology, geology, and soils, helps archaeologists to understand how geological processes have influenced the preservation of archaeological sites. Research conducted by Monaghan and Lovis (2005) demonstrates that deeply buried soils have an increased probability of sustaining cultural resources where fluvial deposits overlie alluvial deposits as a result of waterways breaching their banks. Monaghan and Lovis developed a predictive geoarchaeological model that takes these effects into account and classifies an area's likelihood of having cultural resources from Low to High-Very High.

Based on the Monaghan and Lovis (2005) model, the Project Area intersects with areas modeled as having moderate to high potential for deeply buried archaeological deposits (Figure A-6). [redacted] Otherwise, the remainder of the Project Area is largely mapped as exhibiting a low potential for deeply buried archaeological deposits.

[redacted]

4.7 Cultural Resources Context and Potential

The potential of the Project Area to contain cultural resources was developed through examination of the natural and topographical characteristics of the Project Area and available historic-era maps and aerial photographs.

4.7.1 Potential for Precontact Archaeological Sites

[redacted]

4.7.2 Potential for Postcontact Archaeological Sites

[redacted]

5 SUMMARY AND RECOMMENDATIONS

In summary, the records review established that one cultural resources survey has been conducted previously within the Project Area, and two cultural resources surveys have been conducted in the Study Area. These compliance surveys were negative and did not result in the recordation of cultural resources within the Project Area or the Study Area. However, [redacted] None of the archaeological sites within the Project Area have been evaluated for listing in the NRHP. There are no previously recorded architectural resources within the Project Area and three architectural resources in the Study Area. Based on MI SHPO records and a review of the NRHP, there are no NRHP-listed resources located within the Project Area or Study Area.

There is an overall moderate probability for significant precontact archaeological sites and a low to moderate probability for significant postcontact archaeological sites within the Project Area. [redacted]

Should the project require archaeological survey, the geoarchaeological modeling (Monaghan and Lovis 2005) suggests that shovel testing and/or deep testing (e.g., auguring) may be necessary [redacted] Pedestrian survey is a viable survey methodology as long as alluvial soils are confined to the plow zone (e.g., 12 inches [30 centimeters]); the limits of shovel testing is typically 3 feet (1 m).

Based on the MPSC regulations and our communications with the MI SHPO (personal communication, Sarah Surface-Evans and Scott Slagor, January 30, 2025), SWCA recommends initiating consultation with the MI SHPO. SWCA understands that MI SHPO has initiated a new consultation process for projects subject to permitting through the MPSC, and that the MI SHPO will provide expert testimony regarding cultural resources to the MPSC. To initiate the consultation process, the MI SHPO requests developers to complete a consultation application, in coordination with a professional archaeologist and architectural historian, The MI SHPO will provide their recommendations for next steps, including survey and avoidance requirements. SWCA understands that RWE will have 1 year after submittal of the MPSC permit application to obtain the approval of survey reports or recommendations submitted to the SHPO.

In keeping with Public Act 233, which requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC, SWCA recommends this document be provided to the MPSC for review. Approval from the MPSC is required before development within the boundaries of these sites occurs.

6 REFERENCES CITED

Adrian Daily Telegram. 1921. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21190/Palmyra+Township/Lenawee+County+1921/Michigan/. Accessed November 14, 2024.

———. 1928. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/1610467/Palmyra+Township++Raisin+River/. Accessed November 14, 2024.

Albert, Dennis A. 1995. Regional landscape ecosystems of Michigan, Minnesota and Wisconsin: A working map and classification. General Technical Report NC-178. U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota. Available at: https://www.nrs.fs.usda.gov/pubs/gtr/other/gtr-nc178/index.html. Accessed November 1, 2024.

Bureau of Land Management General Land Office. 2024. Original Survey Plat, Township 7 North, Range 4 East, 3rd Principal Meridian. Available at: https://glorecords.blm.gov/details/survey/default.aspx?dm_id=27676&sid=usa5y3jo.a4o#surveyDetailsTabIndex=0. Accessed November 14, 2024.

Cadwell, George D. 1893. Atlas of Lenawee County, Michigan. Geo. D. Cadwell and Company, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21077/Palmyra+Township/Lenawee+County+1893/Michigan/. Accessed November 14, 2024.

Everts and Stewart. 1874. Combination Atlas Map of Lenawee County, Michigan. Everts and Stewart, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/20906/Palmyra+Township/. Accessed November 14, 2024.

Historic Aerials. 2024. Historic Aerials Viewer. Available at: https://www.historicaerials.com/viewer. Accessed November 14, 2024.

Monaghan, G. William, and William A. Lovis. 2005. *Modeling Archaeological Site Burial in Southern Michigan: A Geoarchaeological Synthesis*. Michigan State University Press, East Lansing.

National Park Service. 2024. National Register of Historic Places Database and Research. Available at: https://www.nps.gov/subjects/nationalregister/database-research.htm. Accessed January 13, 2025.

Natural Resources Conservation Service (NRCS). 2022. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. Washington, D.C.

———. 2024. Custom Soil Report. Available at: http://websoilsurvey.nrcs.usda.gov. Accessed December 12, 2024.

Ogle, George A. 1916. Standards Atlas of Lenawee County, Michigan. Geo. A. Ogle Publishers and Engravers, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/22243/Palmyra+Township/Lenawee+County+1916/Michigan/. Accessed November 14, 2024.

Stillwell, Larry N. 2017. *An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project No. 161134) in Palmyra, Lenawee County, Michigan*. Archaeological Consultants of Ossian. On file at the Michigan State Historic Preservation Office, Lansing, Michigan.

U.S. Environmental Protection Agency. 2023. How's My Waterway Viewer. Available at: https://mywaterway.epa.gov/. Accessed November 14, 2024.

U.S. Geological Survey (USGS). 2024. National Geologic Map Database Project TopoView. Available at: https://ngmdb.usgs.gov/topoview/viewer/#14/41.8731/-83.9695. Accessed November 14, 2024.

APPENDIX A

Figures

Figure A-1. Location of the proposed Rouget Road, LLC Area in Michigan.

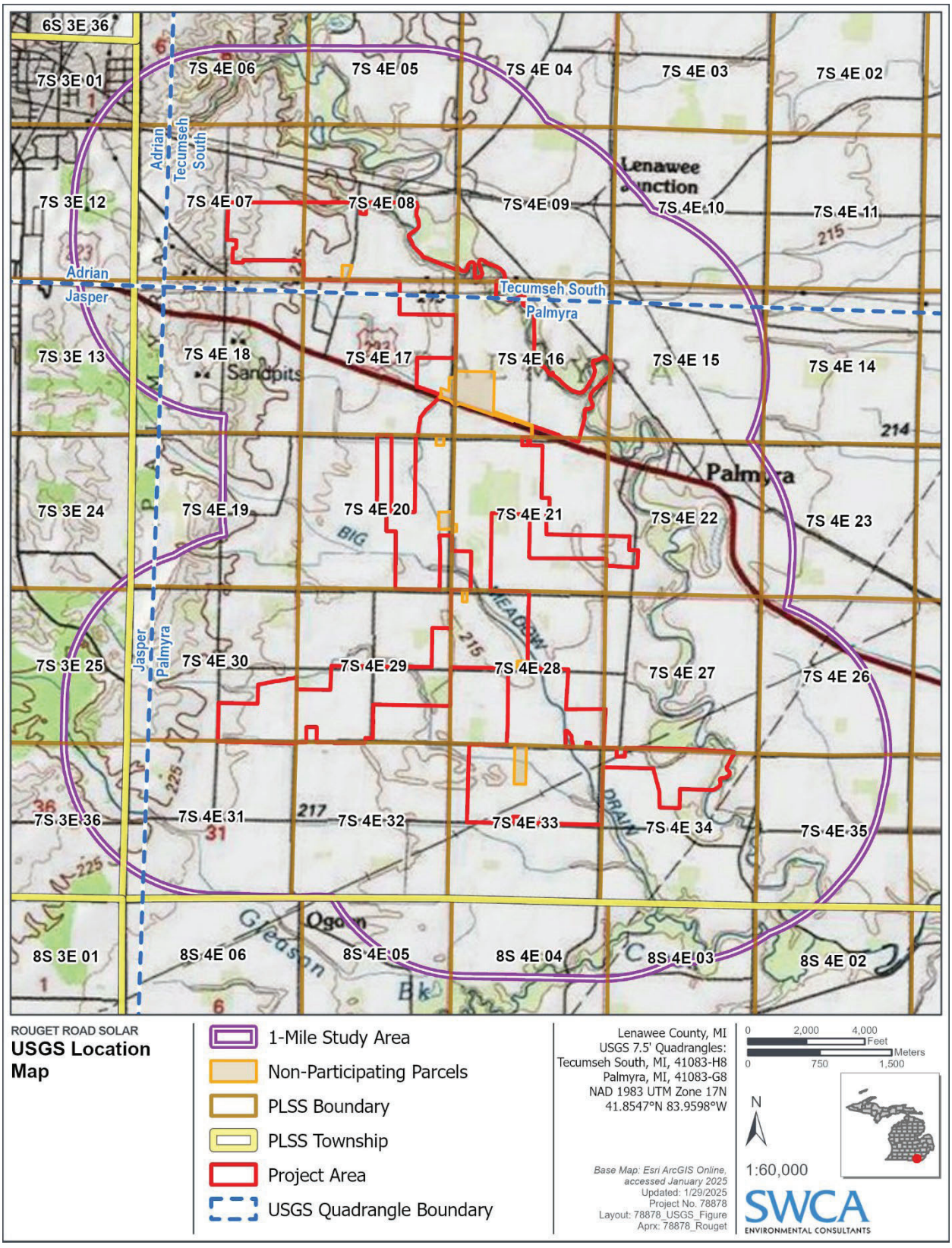

Figure A-2. Location of the Study Area for the proposed Rouget Road, LLC on a USGS topographic map.

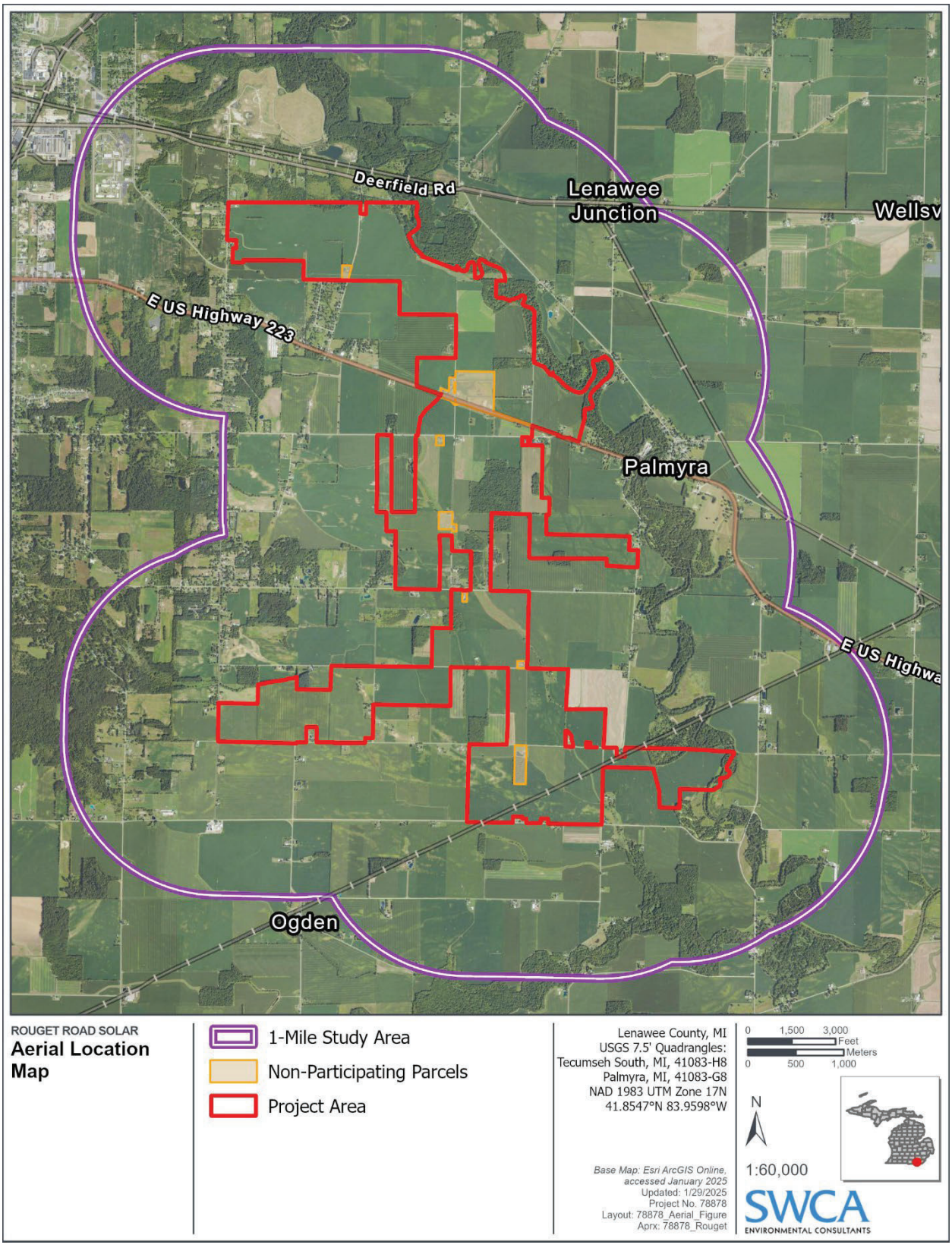

Figure A-3. Overview of the Study Area for the proposed Rouget Road, LLC on aerial imagery.

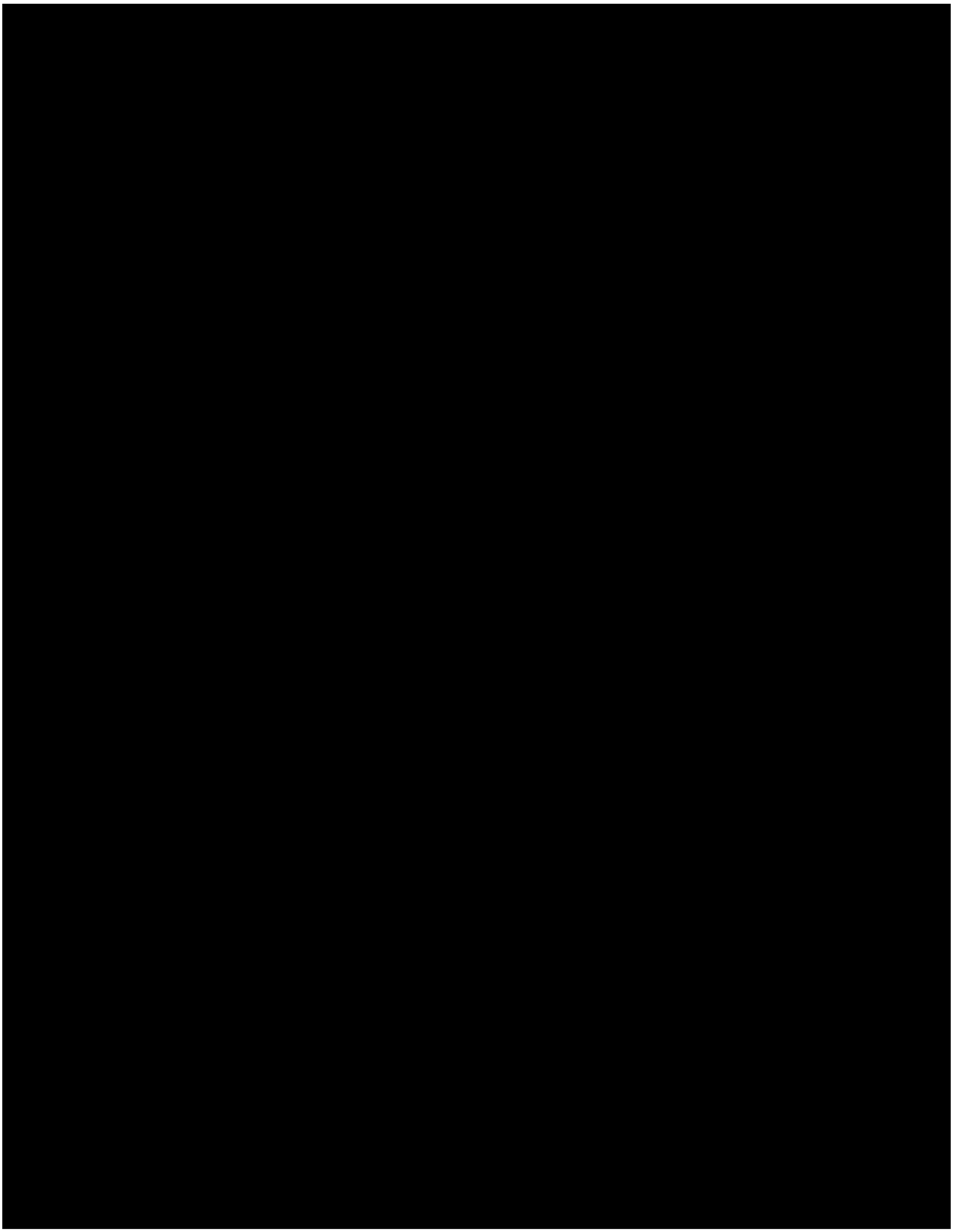

Figure A-4. Results of the background research for previously recorded cultural resources and previously conducted surveys.

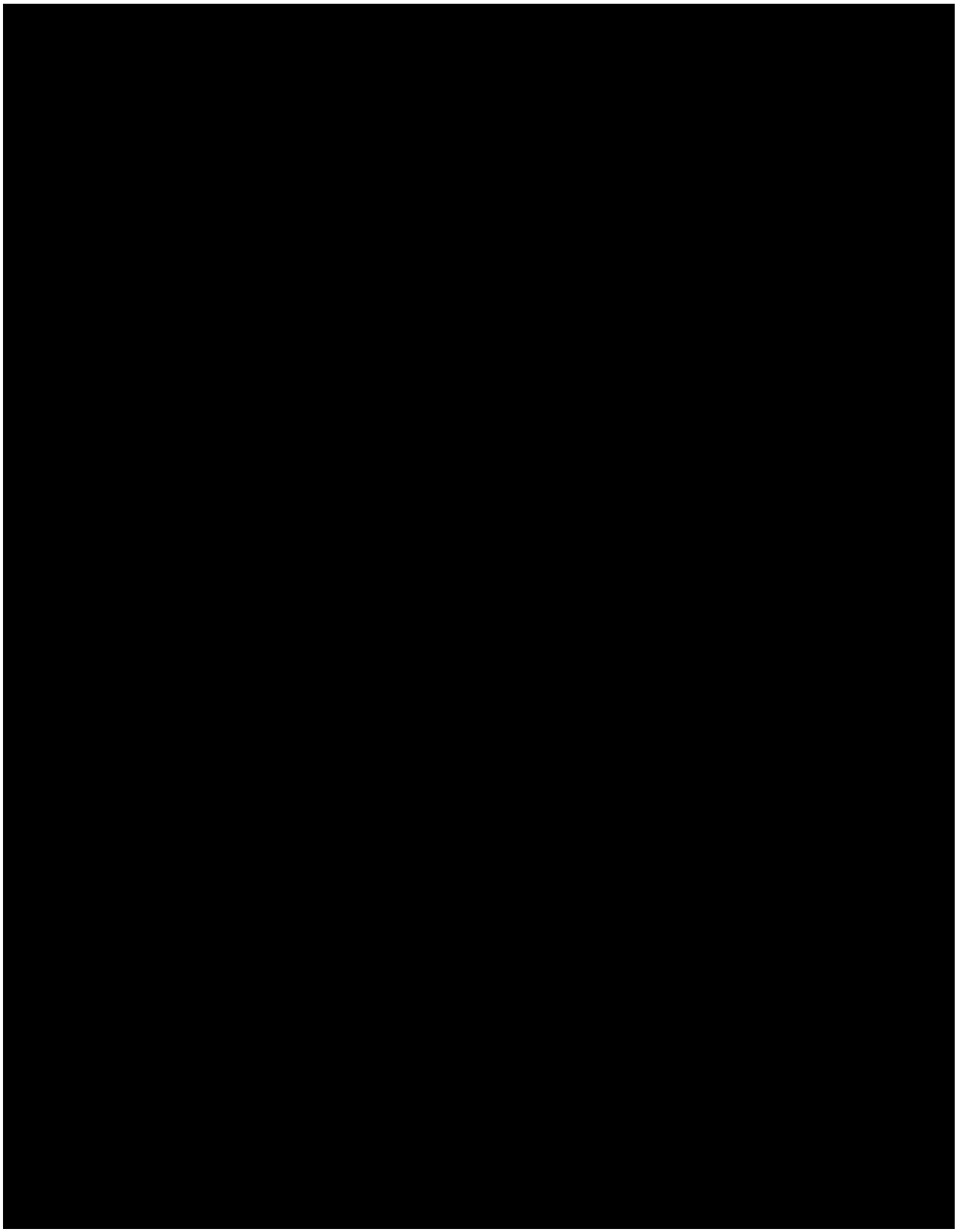

Figure A-5. Results of the background research for postcontact architectural resources and cemeteries.

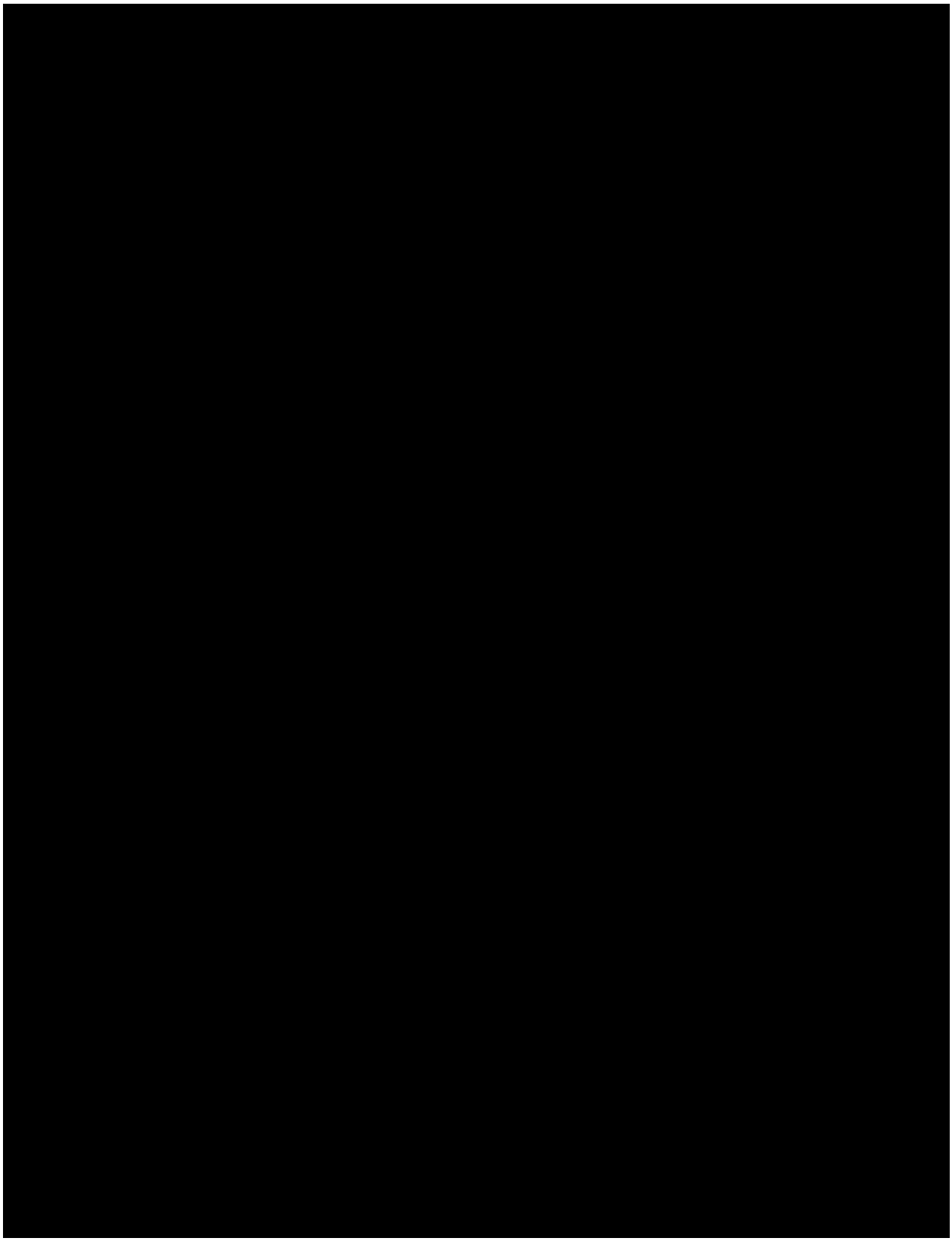

Figure A-6. Areas modeled as having moderate to high potential for deeply buried archaeological deposits in the Project Area and Study Area.

GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
MICHIGAN STRATEGIC FUND
STATE HISTORIC PRESERVATION OFFICE

QUENTIN L. MESSER, JR.
PRESIDENT

September 10, 2025

KEVIN COLE
ROUGET ROAD LLC
10250 PENLAWN DR.
JEROME, MI 49249

RE: SR25-23 PA233 Review Rouget Road, LLC Solar, T07S/R04E/Sec. 7, 8, 9, 15, 16, 17, 20 ,21, 22, 27, 28, 29, 30, 33, and 34, Palmyra Township, Lenawee County (MPSC)

Dear Mr. Cole:

We have received your request for review of the above-cited project under Public Act 233 of 2023 for Renewable Energy and Energy Storage Facility Siting (PA 233) at the above-noted location. We have reviewed the assessment prepared by SWCA, "Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan" and appreciate the information provided. To fully consider and address impacts to cultural and historic sites we require additional information, please send the following:

General

In the materials submitted, the project area boundaries in the submission form and in the Desktop Review do not match. Please ensure that we have the final project boundary maps included in all materials submitted to our office. Desktop Review states that the project plan will avoid archaeological sites, however, the project mapping provided does not make this apparent or clear. We cannot assess the impact of the proposed project on historic resources without accurate mapping information. Additionally, we would like to see the locations of staging areas, vehicle traffic, and any other areas that may have ground disturbance mapped.

Archaeological Resources

Due to the presence of previously documented sites within and near the project area, and the high archaeological sensitivity for the River Raisin valley generally, SHPO requests full archaeological survey for the entire project area, including staging areas. In particular, the boundaries of site 20LE28 are poorly delineated. In order to avoid this site, which is known to contain burials, additional survey methodologies may be necessary beyond pedestrian survey or shovel testing***. SHPO recommends consulting with our office and Tribal Nations with historic connections to this region to develop an appropriate methodology***, which may include geophysical prospection or historic human remains detection dog (HRD) survey. SHPO also recommends developing an Unanticipated Discovery Plan (UDP) for the project. A UDP specifies who will be contacted and what measures will be taken in the event of an unanticipated discovery of archaeological materials or human remains during the project implementation. Please see the UDP template attached, for an example of how these documents are organized. SHPO encourages the project proponent to work with consulting party tribes to develop an

appropriate UDP and protocol for handling human remains.

Above-ground Resources

SHPO concurs with the proposed methodology of utilizing the Above Ground Table in lieu of identification forms except that we require identification forms for properties that are identified as eligible. The table does not provide enough information for eligible properties. For eligible properties, photographs of all resources must also be included in an attachment with Architectural Properties Identification Form. When discussing effects to above-ground resources, please be sure to provide discussion of visual impacts as well as visual barriers in place that may play in to effects determinations. Also be sure that the Historic Resource Survey Report contains enough history and contextual information about the area and resources for SHPO to adequately assess eligibility.

Additional information must be submitted online through our Additional Information Portal.

Please note that our review cannot proceed until we are able to consider the information requested above. This letter is not concurrence. If you have any questions, please contact please contact Senior Archaeologist, Sarah Surface-Evans, surfaceevanss1@michigan.gov, (517) 282-7959 or Historian, Katlyn Burns Yancho, at 517-256-3416, burnsyanchok@michigan.gov. **Please reference our project number in all communication with this office regarding this review.** Thank you for your consultation.

Sincerely,

Sarah Surface-Evans, PhD, RPA
Senior Archaeologist

SES:KAK:KBY:SSE

Enclosure(s): UDP Template

Copy: Anna Gilmer, SWCA

Saginaw Chippewa Indian Tribe of Michigan

From:	Jonathan Libbon
To:	"mlhadden@sagchip.org"
Cc:	Carol Mcknight; Aleyda Galan; Cole, J Kevin; Quarles, Mark; Anna Gilmer
Subject:	Rouget Road Solar Consultation Letter
Date:	Thursday, November 20, 2025 5:00:00 PM
Attachments:	Rouget Tribal Consulation LTR_20Nov2025.pdf image001.png
Sensitivity:	Private

Good Afternoon Marcella,

On behalf of Rouget Road Solar Farm LLC, a wholly-owned subsidiary of RWE Clean Energy LLC (RWE), we are reaching out to request your input on the Rouget Road Solar Farm Project, a proposed solar facility in Lenawee County, Michigan. The facility will require a state siting certificate from the Michigan Public Service Commission (MPSC). The attached letter and documentation outline the project and provide details on the cultural resource work completed to date. We are seeking comments from your area of expertise regarding any potential environmental or cultural effects associated with this project.

Please let me or Kevin Cole (cc'd), the project manager from RWE, know if you have any questions about the project.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

The contents of this email and any associated emails, information, and attachments are CONFIDENTIAL. Use or disclosure without sender's authorization is prohibited. If you are not an authorized recipient, please notify the sender and then immediately delete the email and any attachments.

11/20/2025

Dear Tribal Historic Preservation Officer and/or Tribal Cultural Representative,

As part of its responsibilities under Michigan Public Act 233 of 2023 (PA 233), *Renewable Energy and Energy Storage Facility Siting*, the Michigan Public Service Commission (MPSC) is seeking consultation (as required in PA 233 Section 224.1b[1]) and determining the area of potential effects ("APE") for the proposed project. Federally listed sovereign Nations with an interest in the state of Michigan are invited to review and comment on Rouget Road Solar Farm, LLC's (Rouget Road Solar Farm) (a wholly-owned subsidiary of RWE Clean Energy LLC [RWE]) proposed **Rouget Road Solar Farm Project** (the "Project"). The proposed Project will require a state-siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC (PA 233 Section 226.7b). Although Rouget Road Solar Farm requests a review and comment on the Project, the MPSC is the state agency and may be communicated with directly.

Based on Michigan State Historic Preservation Office (MI SHPO) guidance from their *Instructions for the Application for PA 233 Renewable Energy Storage Facility Siting Consultation Form*:

> "**Public Act 233** requires the applicant for energy siting and storage facilities to consider and address impacts *to the environment and natural resources, including, but not limited to, sensitive habitats and waterways, wetlands and floodplains, wildlife corridors, parks,* ***historic and cultural sites****, and threatened or endangered species*. The applicant must submit this information to the Michigan Public Service Commission (MPSC) for consideration in permitting the project. In order to facilitate considerations of historic and cultural sites (hereafter Historic Properties), the MPSC has required applicants to consult with the State Historic Preservation Office (SHPO)."

This letter is part of the early coordination phase of the environmental review process, requesting comments associated with this Project. We are requesting comments from your area of expertise regarding any possible environmental or cultural effects associated with this Project. Please provide any additional information you may have regarding potential cultural resources in the Project area so they may be accounted for during the environmental review of this Project. This information can be provided directly to RWE or the MPSC.

Project Description

The proposed Project is southeast of the city of Adrian, in Palmyra Township, Lenawee County, Michigan (Figure 1). Historic Mapping places the proposed Project area in Sections 7, 8, 9, 15, 16, 17, 20, 21, 22, 27, 28, 29, 30, 33, and 34 of Township 7 South, Range 4 East as seen on the enclosed USGS 7.5 series for Tecumseh South and Palmyra, Michigan Topographic Quadrangle map (Figure 2). Rouget Road Solar Farm is proposing to construct a 175-megawatt (MW) alternating current (AC) solar photovoltaic power generating facility. The leased area/Project area boundary includes approximately 2,142 acres (867 hectares) (Figures 2 and 3). Construction will require 1,513 acres (612 ha) of what is currently primarily agricultural land (see site plan boundary in Figure 1). Limited tree removal is planned across 7.96 acres (3.22 ha). Proposed work required for the Project includes construction of a switchyard, substations, access

[1] Sections refer to those found at: https://www.legislature.mi.gov/documents/2023-2024/publicact/htm/2023-PA-0233.htm

roads, fencing, MV electrical cabling, and solar panel structures. Construction may also include an operations and maintenance building.

Project Permitting
The proposed Project will require a siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC.

PA 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 MW or more, to wind projects with a capacity of 100 MW or more, and energy storage facilities with a capacity of 50 MW or more. Projects that fall into these categories must identify and provide information on the effects of the Project on environmental, natural, and cultural resources. Additional PA 233 information is available online at State Project Reviews | MiPlace[2], and a Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the MPSC is available online at Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the Michigan Public Service Commission. [3]

Cultural Resource Investigations
The APE is the area in which the proposed Project may cause alterations in the character or use of historic resources. As the site plan boundary includes all locations that may be impacted by ground disturbing activities related to the project undertaking, it is considered the physical APE (see Figure 1). The visual APE for assessing visual effects to historic-age resources is a 0.5-mile buffer from the boundaries of the Project area (e.g., leased area/project boundary) (see Figure 2). This boundary will be modified based on visual intrusions that may obscure the project.

Rouget Road Solar Farm has contracted SWCA Environmental Consultants (SWCA) to conduct the archaeological and architectural history surveys. Due to the presence of previously--documented archaeology sites in and near the Project area, and the archaeological sensitivity for the River Raisin Valley, SWCA will conduct a full archaeological survey for the physical APE, including staging areas. The boundaries of [redacted], is mapped as lying within the proposed Project area; however, these site boundaries are mapped based off archival records and the extent of the complex is poorly understood. In order to be sensitive toward this [redacted], we are asking for your input on the extent of the complex and the survey methodologies that may be necessary beyond [redacted] An Unanticipated Discoveries Plan (Exhibit A-1.14 in the MPSC permit application) has been prepared.

Summary of Requested Action
We look forward to consulting with your office on this Project and to a continued dialogue. We ask that you provide any comments regarding the Project area following your review of the enclosure. Please use the above Project name and Project description in your reply.

In summary, the MPSC and Rouget Road Solar Farm are requesting Tribal Governments to:

[2] https://www.miplace.org/historic-preservation/programs-and-services/cultural-resource-management-and-planning/state-project-reviews/

[3] https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/consumer/MPSC_Tribal_Involvement_Guide.pdf?rev=399582a67fbe46e883e6f21d1325e785&hash=AA471378E81539AFBBA758AB04FB3D25

1. Review the Project information.
2. Identify cultural or environmental concerns.
3. Provide feedback on archaeological methodologies (especially near site 20LE28).
4. Ensure that any cultural resources are addressed in the MPSC permitting process.

All comments will be documented and considered in Project design and the forthcoming MPSC state siting process. Consultation with SHPO and the THPOs included in the distribution list below will be incorporated into the cultural survey plan, recordation, and design updates as needed. Your timely response will greatly help us incorporate your concerns into the development of the Project. For that purpose, we request that you provide comments by December 20, 2025.

Tribal consulting parties may respond to myself (Kevin Cole) at rougetroadsola@rwe.com with any comments or concerns. Alternatively, you can reach out directly to Gustavo Cordero at the MPSC at corderog@michigan.gov.

Respectfully,

Kevin Cole
RWE Development Manager
rougetroadsola@rwe.com

cc: Gustavo Cordero, Michigan Public Service Commission
Carol McKnight, SWCA Environmental Consultants
Anna Gilmer, SWCA Environmental Consultants

Distribution List:
Forest County Potawatomi Community, Wisconsin
Hannahville Indian Community, Michigan
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
Little Traverse Bay Bands of Odawa Indians, Michigan
Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan
Menominee Indian Tribe of Wisconsin
Miami Tribe of Oklahoma
Pokagon Band of Potawatomi Indians, Michigan and Indiana
Sault Ste. Marie Tribe of Chippewa Indians, Michigan
Seneca-Cayuga Nation

Enclosures:
1. Figures
    a. Figure 1: State location map
    b. Figure 2: Portions of the USGS 7.5' series Tecumseh South and Palmyra Michigan Topographic Quadrangles showing the Project area.
    c. Figure 3: Aerial view of the Project area location in Palmyra Township, Lenawee County, Michigan.
2. Cultural Desktop Report
3. SHPO PA233 Response

Figure 1. Location of the proposed Rouget Road Solar Project Area in Michigan.

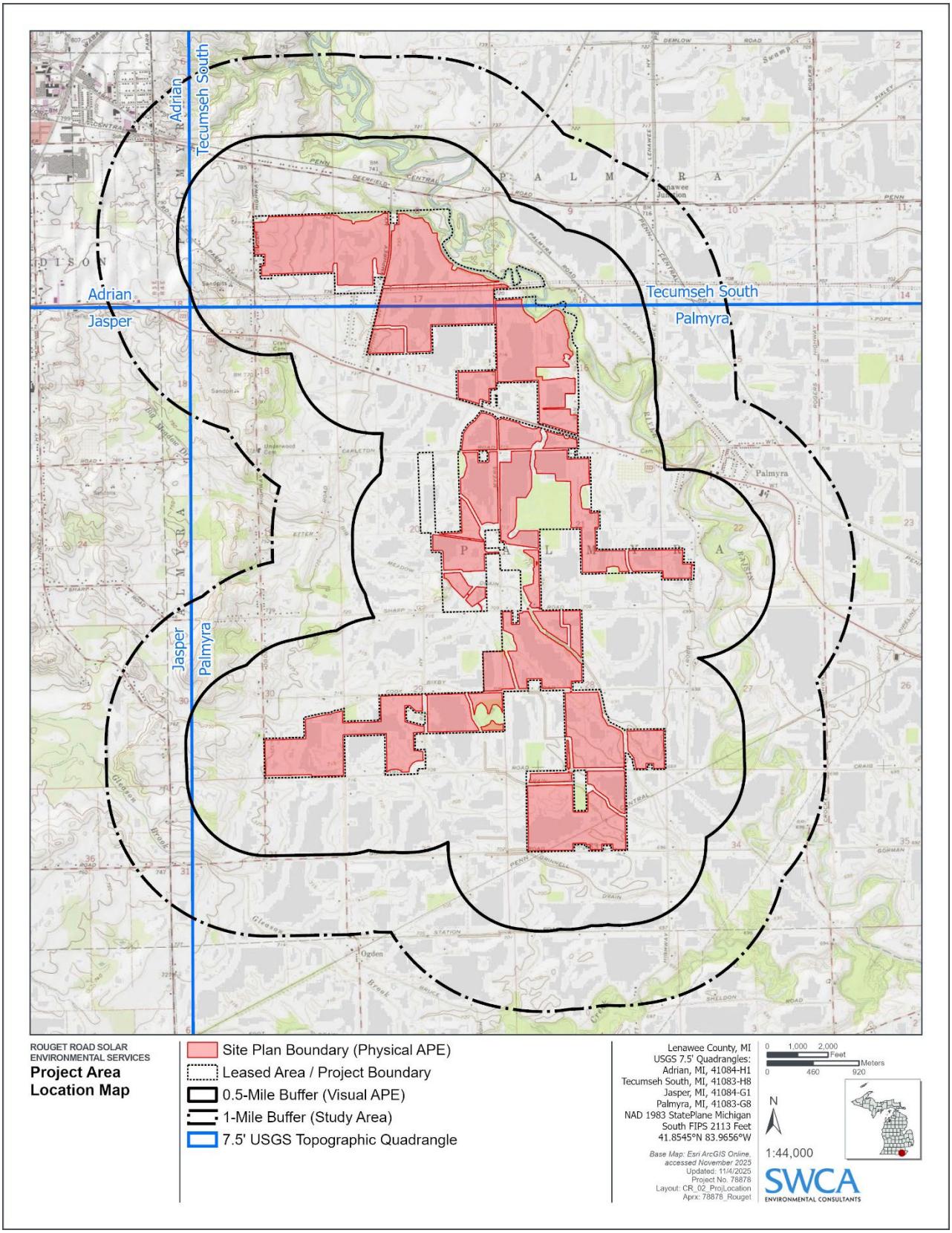

Figure 2. Portions of the USGS 7.5' series Tecumseh South and Palmyra, Michigan Topographic Quadrangles showing the site plan boundary and leased area/Project boundary.

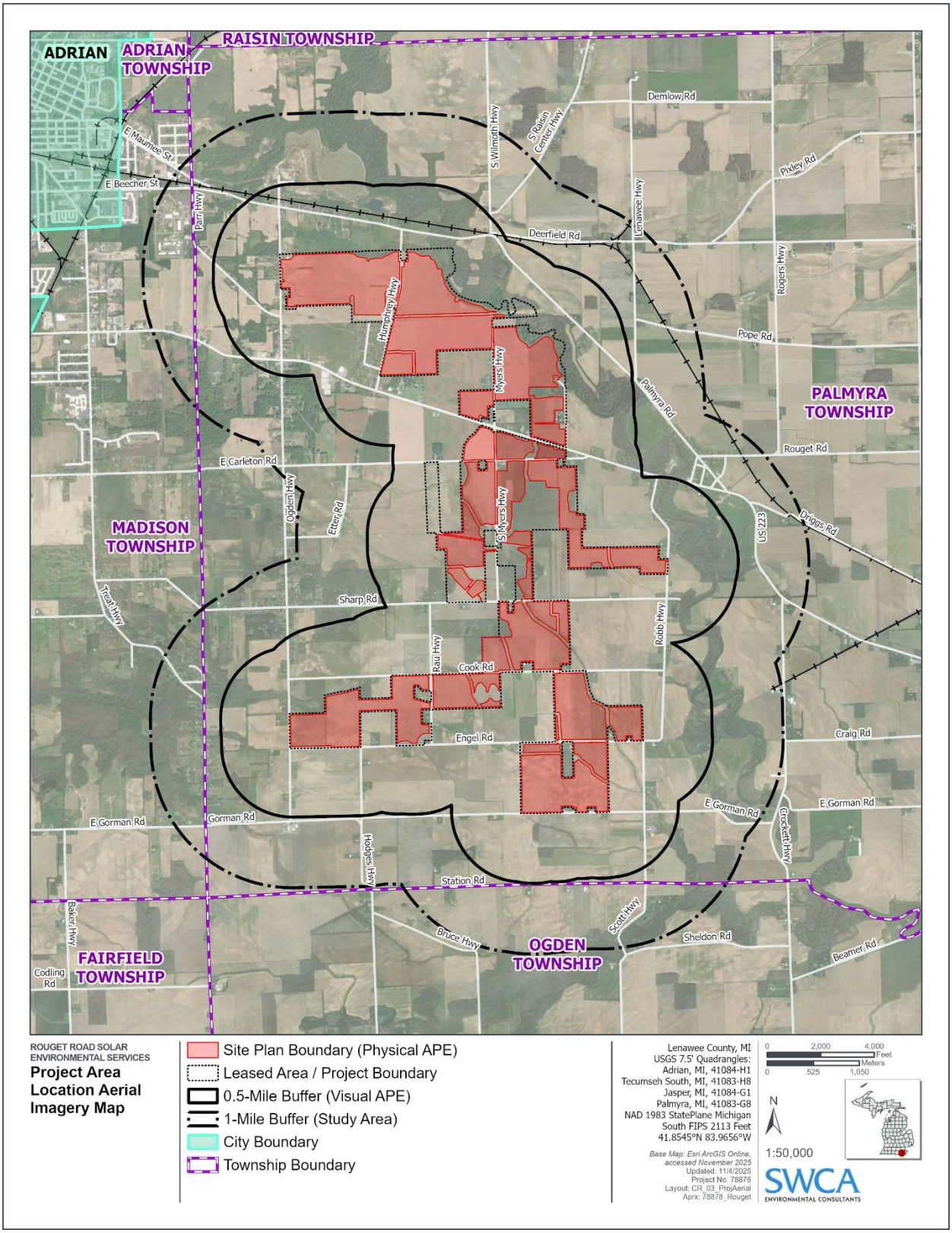

Figure 3. Aerial view showing the site plan boundary and leased area/Project boundary in Palmyra Township, Lenawee County, Michigan.

Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan

JANUARY 2025

PREPARED FOR

Rouget Road, LLC

PREPARED BY

SWCA Environmental Consultants

CULTURAL RESOURCES DESKTOP REVIEW FOR THE ROUGET ROAD, LLC LENAWEE COUNTY, MICHIGAN

Prepared for

Rouget Road, LLC
353 North Clark Street, 30th Floor
Chicago, Illinois 60654
Attn: J Kevin Cole

Prepared by

Rachel Lawrence, M.A., RPA
Heather MacIsaac, B.A.

and

Anna Gilmer, M.A., RPA

SWCA Environmental Consultants
200 22nd Street, Suite 220
Lombard, Illinois 60148
(630) 705-1762
www.swca.com

SWCA Project No. 78878

SWCA Cultural Resources Report No. 25-27

January 2025

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1 INTRODUCTION

SWCA Environmental Consultants (SWCA) completed a cultural resources desktop review for the proposed Rouget Road, LLC (project), located in Lenawee County, Michigan (Figure A-1 in Appendix A). The Project Area spans approximately 2,490 acres (1,008 hectares) of privately owned land near the towns of Adrian, Palmyra, and Ogden. SWCA completed the desktop review for the Project Area plus a surrounding 1.0-mile (1.6-kilometer) buffer around the Project Area. The surrounding 1.0-mile buffer is henceforth referred to as the Study Area (Figures A-2 and A-3).

The objective of the desktop review was to identify existing cultural resources within the Project Area and Study Area to inform project facility siting. Additionally, the Study Area was evaluated to gain an understanding of the type and density of cultural resources in the vicinity of the Project Area. This report summarizes the methods SWCA used to complete the desktop review and presents the results of the background research. It does not serve as Section 106 clearance for the proposed project.

2 REGULATORY FRAMEWORK

Projects in Michigan can come under the purview of two primary cultural resources regulations, the National Historic Preservation Act (NHPA) and Michigan's Natural Resources and Environmental Protection Act. Both are administered by the Michigan State Historic Preservation Office (MI SHPO).

If the project is deemed a federal undertaking (requiring a federal permit, license, or approval; being located on federally owned or managed land; or receiving federal financial assistance), a cultural resources survey most likely would be mandated to ensure compliance with Section 106 of the NHPA. The scope of required cultural resources surveys would then be determined by the functioning federal lead agency in cooperation with the MI SHPO and, if applicable, the pertinent Tribal Historic Preservation Offices as defined in both Section 101 of the National Environmental Policy Act and Section 106 of the NHPA.

Under Michigan law, the state oversees all archaeology performed on state land. The Natural Resources and Environmental Protection Act (Public Act 451 of 1994, Part 761) requires that a permit be obtained prior to undertaking any archaeological investigation on state land.

Public Act 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 megawatts or more, to wind projects with a capacity of 100 megawatts or more, and to energy storage facilities with a capacity of 50 megawatts or more. Public Act 233allows developers the option of applying to the Michigan Public Service Commission (MPSC) to construct utility-scale renewable energy facilities if the local unit of government does not have a compatible renewable energy ordinance. If a compatible renewable energy ordinance is in place, the developer must apply with the local unit of government first, but if the project is denied, the developer may submit to the MPSC for approval. Projects that fall into these categories must identify and provide information on the effects of the project on environmental, natural, and cultural resources.

The project will occur solely on privately held land; thus, no state or local laws requiring archaeological investigations or surveys are anticipated to apply for this project. However, Public Act 233 requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC.

3 METHODOLOGY

SWCA initially submitted a request for in-person research to the MI SHPO on April 7, 2023. Staff at the MI SHPO approved the request and scheduled a research appointment for April 20, 2023. An SWCA archaeologist obtained information in person on previous cultural resources surveys, previously recorded archaeological resources, and previously recorded postcontact architectural resources within the Study Area.

As the Project Area and Study Area were revised in fall 2024, SWCA submitted a second request to the MI SHPO for archaeology and survey site files within the revised Study Area. MI SHPO provided all available records on December 9, 2024. Due to the ongoing updates to the MI SHPO's database, a process that was initiated on February 24, 2024, only archaeology files are currently available. Postcontact architecture files and both postcontact architectural and archaeological survey reports are not currently available as the MI SHPO are scanning these files for upload into a new database. As such, SWCA relied on the April 2023 postcontact architectural resource files and survey reports for this review. SWCA additionally reviewed the National Register of Historic Places (NRHP) database for Michigan as the best available recent data regarding architectural resources.

In addition to the site file search, SWCA investigated historic plat and topographic maps and historic aerial imagery of the Project Area and Study Area. SWCA also researched environmental factors such as modern and historic land use and soil units mapped by the Natural Resources Conservation Service (NRCS) to determine the likelihood of the project to encounter previously unrecorded precontact or postcontact archaeological resources.

4 RESULTS

4.1 Physiography, Geology, and Soils

The Project Area is situated within the Erie-Huron Lake Plain of the Eastern Lake section of the Central Lowland province of the Interior Plains (NRCS 2022:343). The Erie-Huron Lake Plain is a fairly level glacial lake plain with scattered sandy ridges formed by former shorelines and moraines. Elevation ranges from approximately 570 to 815 feet (175 to 250 meters [m]), whereas local relief averages 10 feet (3 m). Major confluences in the Erie-Huron Lake Plain include the Clinton, Huron, and Saginaw Rivers, which empty into the Great Lakes. The Project Area is located within the Floodwood Creek-River Raisin watershed and the Big Meadow Drain-Black Creek watershed, which empty into the River Raisin (U.S. Environmental Protection Agency 2023). Mississippian- to Silurian-age limestone, shale, and dolomite are common along the surface and along the shores of Lake Erie and Lake Huron. Broad, level, and somewhat poorly drained lake plains feature American beech, sugar maple, silver maple, green ash, pin oak, swamp white oak, and American elm, whereas sandy areas feature eastern white pine, eastern hemlock, and other coniferous trees (NRCS 2022:344).

This ecoregion is also part of the Maumee Lake Plain and the Ann Arbor Moraines sub-subsections. The Maumee Lake Plain is a broad, flat, glaciated clay lake plain with rich, loamy soils deeply mantled by till and outwash and dissected by broad glacial drainageways containing sandy soils (Albert 1995). This region formerly included beech-sugar maple forest, elm-ash forest, deciduous swamps, white oak-black oak savannas, wet prairies, and coastal marshes, but now has been largely cultivated (Albert 1995; NRCS 2022). The Ann Arbor Moraines sub-subsection is a long, narrow band of fine- and medium-textured end and ground moraine bordered by flat lake plain on the east and by sandy outwash, end moraine, and ice-contact features to the west. This region formerly supported oak and oak-hickory forests, with oak

savannas along the western edge (Albert 1995). Major wildlife species in the Erie-Huron Lake Plain area include white-tailed deer; cottontail rabbits; squirrels; raccoons; pheasants; bobwhite quail; songbirds; various species of snakes, frogs, and turtles; sunfish; perch; bass; walleye; catfish; carp, sucker; and northern pike.

There are 40 soil series mapped within the Project Area by the NRCS (Table 1). The soils range from very poorly drained to excessively drained loams to sandy loams. The most common soils for the Project Area include Brady and Macomb loams, 0 to 3 percent slopes; Colwood very fine sandy loam, 0 to 3 percent slopes; Wauseon loam, 0 to 3 percent slopes; Ziegenfuss clay loam, 0 to 1 percent slopes; Brady and Macomb sandy loams, 0 to 3 percent slopes; and Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes. These soil types, and their implication for site formation processes and archaeological potential, are discussed further in Section 4.6.

Table 1. Soils within the Project Area

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
BbA	Berrien loamy sand, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BbB	Berrien loamy sand, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcA	Berrien sandy loam, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcB	Berrien sandy loam, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BhA	Brady sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on strand plains	Loamy over sandy and gravelly glaciofluvial deposits
BkA	Brady and Macomb loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BnA	Bronson sandy loam, 0 to 3 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BnB	Bronson sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BoA	Brookston loam, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
CbB	Cadmus sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over loamy till
CeA	Colwood very fine sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CgA	Conover loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Loamy till
GbA	Genesee sandy loam, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
GcA	Genesee and Eel loams, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GgA	Griffin and Sloan loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Clayey till
KbC	Kendallville sandy loam, 7 to 15 percent slopes	Well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over till
KeA	Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on deltas	Stratified loamy glaciofluvial deposits
LcA	Linwood muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Wood organic material over loamy till
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Drainageways on till-floored lake plains	Sandy and/or loamy glaciofluvial deposits over loamy till
NaA	Nappanee silt loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Clayey till
NbB	Nappanee loam, 3 to 7 percent slopes	Somewhat poorly drained	Knolls on ground moraines	Clayey till
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	Somewhat poorly drained	Knolls on ground moraines	Clayey till
OcC	Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded	Excessively drained	Beaches on till-floored lake plains	Glaciofluvial deposits and/or sandy glaciolacustrine deposits over loamy till
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	Poorly drained	Depressions on till plains	Loamy till
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PdB	Plainfield and Berrien loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PeB	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PwmaaA	Pewamo clay loam, dense substratum, 0 to 1 percent slopes	Poorly drained	Drainageways on nearshore zones (relict), flats on nearshore zones (relict)	Clayey till over dense till
RbA	Rollin muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Herbaceous organic material over marl
SbA	Sebewa sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on glacial drainage channels	Loamy over sandy and gravelly glaciofluvial deposits
Sf	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	Poorly drained	Drainageways on stream terraces, drainageways	Loamy drift over sandy and gravelly outwash
WcA	Wauseon loam, 0 to 3 percent slopes	Poorly drained	Depressions on till-floored lake plains	Glaciolacustrine deposits over clayey till

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	Poorly drained	Wave-worked till plains	Clayey till over loamy till
W	Water	N/A	N/A	N/A

Source: NRCS (2024).

4.2 Historical Land Use

SWCA reviewed historic plat and topographic maps, as these sources provide information on past land use within the Project Area and Study Area that may indicate the probability of encountering significant precontact and postcontact cultural resources in or near the Project Area. The historic maps indicate that there has been a general consistency in the road network and land-use patterns from the late nineteenth century into the modern era in the Study Area.

The earliest available map of the Project Area is an 1819 General Land Office survey map (Bureau of Land Management General Land Office 2024). The Project Area is uninhabited. The River Raisin is drawn as a winding water course east of the Project Area. There are patches of marshlands, and tributaries are marked but not fully drawn. No structures are depicted. Palmyra and Lenawee Junction have not yet been established.

The first available plat map, dated 1874, shows that the Project Area and Study Area had been divided into large landholdings. Residences, schools, and churches are depicted. Roads and three railroads also are in place, including the Lenawee County Railroad and Palmyra Road. The current U.S. Highway 233 is shown as a railroad. Several structures are depicted on landholdings within the Project Area. Some of these structures are adjacent to orchards or small agricultural fields. There are branches of unnamed tributaries flowing throughout the Project Area, one of which is the modern Big Meadow Drain (Everts and Stewart 1874).

By 1893, the Project Area is depicted similarly to the 1874 plat. More landowners have appeared, represented by smaller landholdings, and structures are depicted within the Project Area. The unnamed tributaries are still depicted, running through the central and southern portions of the Project Area (Cadwell 1893).

The 1916 plat map shows an increase in landowners once more as the communities of Lenawee Junction and Palmyra continue to grow. Structures also are depicted on these parcels in the Project Area and are shown mostly along roads. U.S. Highway 233 is depicted as the Toledo Western electric railroad. There is another railroad that runs north-south to the Toledo Western electric railroad, connecting from Adrian to Palmyra within the Project Area. This segment of rail had been a road on the 1874 and 1893 plat maps. Several tributaries also are shown within the Project Area (Ogle 1916).

The 1921 plat map does not show individual structures beyond churches and schools, neither of which are in the Project Area. Landowner names are given, and the road network and railroads appear in the same location as on previous plats (*Adrian Daily Telegram* 1921). The 1928 plat presents the same information (*Adrian Daily Telegram* 1928).

SWCA also reviewed historic topographic maps to determine the land use of the Project Area and Study Area. Four historic topographic maps from 1939 to 1972 show that there has been little development from the early twentieth century to the present (U.S. Geological Survey [USGS] 2024). On the earliest available topographic map (Blissfield, Michigan, 1939, 1958 edition), multiple structures are shown in the

Project Area along roadways. The tributaries shown on the plat maps are named and shown: Big Meadow Drain, Bixby Drain, and Grinnell Drain. The road network and railroads are also depicted. The 1941 Blissfield, Michigan, topographic map reveals a similar image. The 1972 Palmyra, Michigan, and 1972 Tecumseh South, Michigan, topographic quadrangles name most of the roads in the Project Area, and they show that residential development had not increased outside of Palmyra and Adrian. Transmission and telecommunication cables are also depicted (USGS 2024).

A review of 17 aerial photographs taken between 1955 and 2022 indicates that minimal land development occurred within the Project Area and its environs. On the aerial images beginning in 1955, the landscape is agricultural. Isolated farmsteads are visible along roadways outside of Palmyra, Lenawee Junction, and Adrian. Drainages are visible either as scars on the landscape or are lined with trees, as is the River Raisin. There are some stands of trees throughout the Project Area. Between 1955 and 2022, no noticeable changes occur to the land use in the Project Area or Study Area (Historic Aerials 2024).

4.3 Previous Cultural Resources Surveys

A review of MI SHPO records identified one cultural resources survey that was conducted in the Project Area and two cultural resources surveys conducted within the Study Area (Table 2). Project ER00-7.17.161134 was a reconnaissance investigation conducted in 2017 by Archaeological Consultants of Ossian. The survey area covered 0.44 acre of land, and no cultural resources were identified during the survey (Stillwell 2017). Project ER17-391 was conducted for the Howard Street/West Michigan CMAQ and Rehabilitation project; however, the MI SHPO records did not contain information on the surveyors, year, or report title. Project B17-258, identified on quad maps in the MI SHPO research repository as Lauterbur 2016, was a Phase I archaeological survey conducted in support of the replacement of the River Raisin Bridge in Palmyra, Michigan. The MI SHPO records did not include information on the extent of the survey; however, no archaeological sites were identified during the survey.

Table 2. Previous Cultural Resources Surveys in the Study Area

Project ID	Project Name	Survey Year	Surveyors	Report Title	Location
ER00-7.17.161134	G2 Cellular Tower Site Review #161134	2017	Archaeological Consultants of Ossian	*An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project #161134) in Palmyra, Lenawee Conty, Michigan. 17FR29Mi.*	Project Area
ER17-391	Howard Street/ West Michigan CMAQ and Rehabilitation	None recorded	None recorded	None recorded	Study Area
B17-258	Lauterbur 2016	2016	Michigan Department of Transportation	*Archaeological Investigations at US-223 River Raisin Bridge Replacement, Palmyra, Lenawee County.*	Study Area

4.4 Previously Recorded Archaeological Sites

[redacted]

[redacted]

4.5 Previously Recorded Architectural Resources and Cemeteries

SWCA reviewed the National Park Service's NRHP database for Lenawee County, Michigan, regarding information on historic districts, buildings, archaeological sites, and other properties eligible for or listed in the NRHP. The NRHP database did not identify any NRHP-listed resources within the Project Area (National Park Service 2024).

SWCA also reviewed historic architecture data provided by the MI SHPO in April 2023. No previously recorded architectural resources are located within the Project Area; three architectural resources are located in the Study Area (Table 4; Appendix A: Figure 5).

No recorded cemeteries are present in the Project Area; two postcontact cemeteries (Palmyra Village Cemetery and Crane Cemetery) are located within the Study Area (Table 5; Appendix A: Figure 5). Palmyra Village Cemetery was included in the MI SHPO site file data, while Crane Cemetery was identified through archival research of historic topographic maps. Due to the data gap in the MI SHPO site file records since February 2024, it is not clear if Crane Cemetery is still absent from MI SHPO site file records.

Table 4. Previously Recorded Historic Architectural Resources in the Study Area

Site ID	Historic Name	City	NRHP Status	Location
P23943	Palmyra Presbyterian Church	Palmyra	Unevaluated	Study Area
P61449	Bruce Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area
P61451	Scott Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area

Table 5. Previously Recorded Cemeteries in the Study Area

Historic Name	Record Source	Location
Palmyra Village Cemetery	MI SHPO site file data	Study Area
Crane Cemetery	Archival research	Study Area

4.6 Geoarchaeology

Geoarchaeology, which is a multidisciplinary field that incorporates topography, geomorphology, geology, and soils, helps archaeologists to understand how geological processes have influenced the preservation of archaeological sites. Research conducted by Monaghan and Lovis (2005) demonstrates that deeply buried soils have an increased probability of sustaining cultural resources where fluvial deposits overlie alluvial deposits as a result of waterways breaching their banks. Monaghan and Lovis developed a predictive geoarchaeological model that takes these effects into account and classifies an area's likelihood of having cultural resources from Low to High-Very High.

Based on the Monaghan and Lovis (2005) model, the Project Area intersects with areas modeled as having moderate to high potential for deeply buried archaeological deposits (Figure A-6). [redacted] Otherwise, the remainder of the Project Area is largely mapped as exhibiting a low potential for deeply buried archaeological deposits.

[redacted]

4.7 Cultural Resources Context and Potential

The potential of the Project Area to contain cultural resources was developed through examination of the natural and topographical characteristics of the Project Area and available historic-era maps and aerial photographs.

4.7.1 Potential for Precontact Archaeological Sites

[redacted]

4.7.2 Potential for Postcontact Archaeological Sites

[redacted]

5 SUMMARY AND RECOMMENDATIONS

In summary, the records review established that one cultural resources survey has been conducted previously within the Project Area, and two cultural resources surveys have been conducted in the Study Area. These compliance surveys were negative and did not result in the recordation of cultural resources within the Project Area or the Study Area. However, [redacted] None of the archaeological sites within the Project Area have been evaluated for listing in the NRHP. There are no previously recorded architectural resources within the Project Area and three architectural resources in the Study Area. Based on MI SHPO records and a review of the NRHP, there are no NRHP-listed resources located within the Project Area or Study Area.

There is an overall moderate probability for significant precontact archaeological sites and a low to moderate probability for significant postcontact archaeological sites within the Project Area. [redacted]

Should the project require archaeological survey, the geoarchaeological modeling (Monaghan and Lovis 2005) suggests that shovel testing and/or deep testing (e.g., auguring) may be necessary [redacted] Pedestrian survey is a viable survey methodology as long as alluvial soils are confined to the plow zone (e.g., 12 inches [30 centimeters]); the limits of shovel testing is typically 3 feet (1 m).

Based on the MPSC regulations and our communications with the MI SHPO (personal communication, Sarah Surface-Evans and Scott Slagor, January 30, 2025), SWCA recommends initiating consultation with the MI SHPO. SWCA understands that MI SHPO has initiated a new consultation process for projects subject to permitting through the MPSC, and that the MI SHPO will provide expert testimony regarding cultural resources to the MPSC. To initiate the consultation process, the MI SHPO requests developers to complete a consultation application, in coordination with a professional archaeologist and architectural historian, The MI SHPO will provide their recommendations for next steps, including survey and avoidance requirements. SWCA understands that RWE will have 1 year after submittal of the MPSC permit application to obtain the approval of survey reports or recommendations submitted to the SHPO.

In keeping with Public Act 233, which requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC, SWCA recommends this document be provided to the MPSC for review. Approval from the MPSC is required before development within the boundaries of these sites occurs.

6 REFERENCES CITED

Adrian Daily Telegram. 1921. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21190/Palmyra+Township/Lenawee+County+1921/Michigan/. Accessed November 14, 2024.

———. 1928. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/1610467/Palmyra+Township++Raisin+River/. Accessed November 14, 2024.

Albert, Dennis A. 1995. Regional landscape ecosystems of Michigan, Minnesota and Wisconsin: A working map and classification. General Technical Report NC-178. U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota. Available at: https://www.nrs.fs.usda.gov/pubs/gtr/other/gtr-nc178/index.html. Accessed November 1, 2024.

Bureau of Land Management General Land Office. 2024. Original Survey Plat, Township 7 North, Range 4 East, 3rd Principal Meridian. Available at: https://glorecords.blm.gov/details/survey/default.aspx?dm_id=27676&sid=usa5y3jo.a4o#surveyDetailsTabIndex=0. Accessed November 14, 2024.

Cadwell, George D. 1893. Atlas of Lenawee County, Michigan. Geo. D. Cadwell and Company, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21077/Palmyra+Township/Lenawee+County+1893/Michigan/. Accessed November 14, 2024.

Everts and Stewart. 1874. Combination Atlas Map of Lenawee County, Michigan. Everts and Stewart, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/20906/Palmyra+Township/. Accessed November 14, 2024.

Historic Aerials. 2024. Historic Aerials Viewer. Available at: https://www.historicaerials.com/viewer. Accessed November 14, 2024.

Monaghan, G. William, and William A. Lovis. 2005. *Modeling Archaeological Site Burial in Southern Michigan: A Geoarchaeological Synthesis*. Michigan State University Press, East Lansing.

National Park Service. 2024. National Register of Historic Places Database and Research. Available at: https://www.nps.gov/subjects/nationalregister/database-research.htm. Accessed January 13, 2025.

Natural Resources Conservation Service (NRCS). 2022. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. Washington, D.C.

———. 2024. Custom Soil Report. Available at: http://websoilsurvey.nrcs.usda.gov. Accessed December 12, 2024.

Ogle, George A. 1916. Standards Atlas of Lenawee County, Michigan. Geo. A. Ogle Publishers and Engravers, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/22243/Palmyra+Township/Lenawee+County+1916/Michigan/. Accessed November 14, 2024.

Stillwell, Larry N. 2017. *An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project No. 161134) in Palmyra, Lenawee County, Michigan*. Archaeological Consultants of Ossian. On file at the Michigan State Historic Preservation Office, Lansing, Michigan.

U.S. Environmental Protection Agency. 2023. How's My Waterway Viewer. Available at: https://mywaterway.epa.gov/. Accessed November 14, 2024.

U.S. Geological Survey (USGS). 2024. National Geologic Map Database Project TopoView. Available at: https://ngmdb.usgs.gov/topoview/viewer/#14/41.8731/-83.9695. Accessed November 14, 2024.

APPENDIX A

Figures

Figure A-1. Location of the proposed Rouget Road, LLC Area in Michigan.

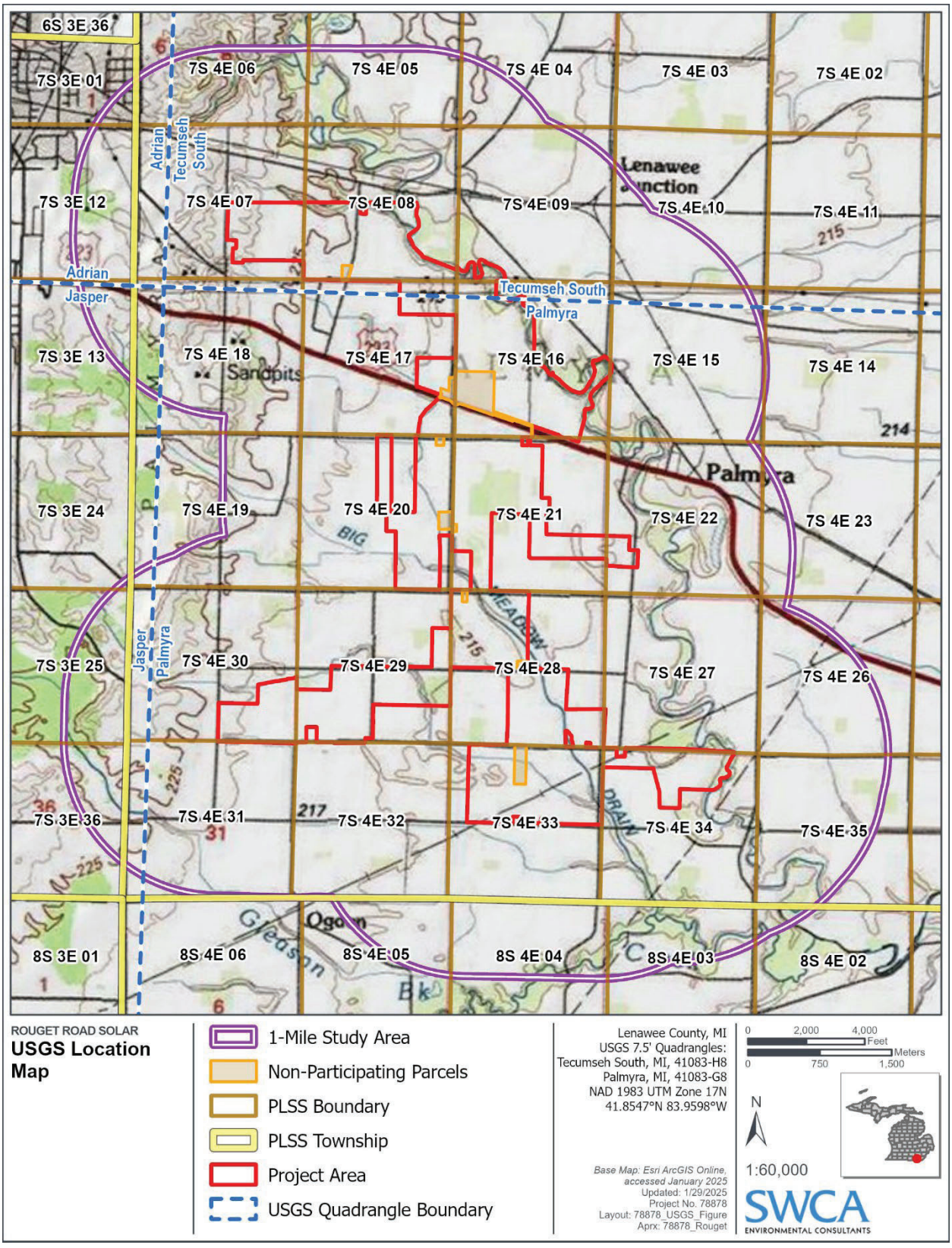

Figure A-2. Location of the Study Area for the proposed Rouget Road, LLC on a USGS topographic map.

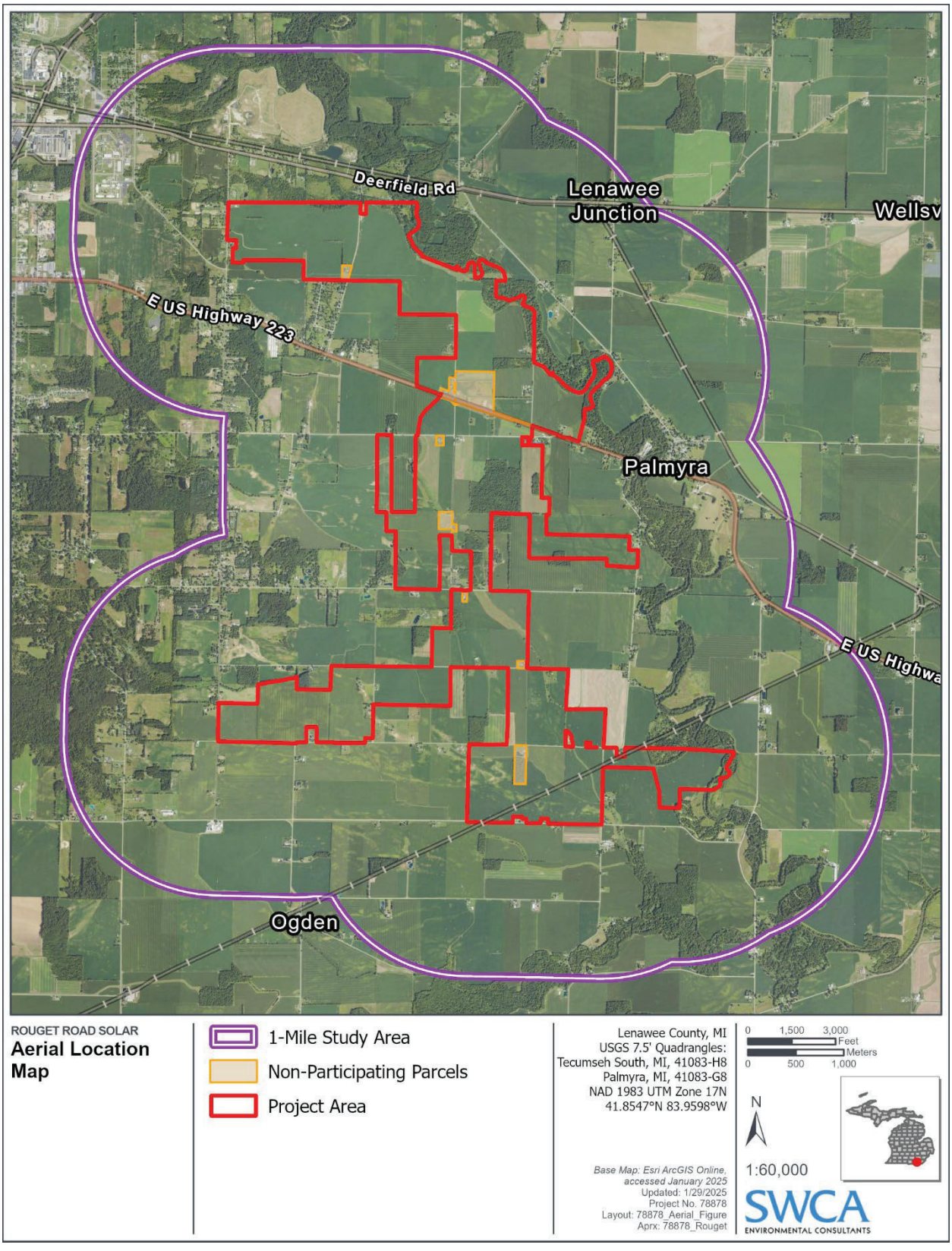

Figure A-3. Overview of the Study Area for the proposed Rouget Road, LLC on aerial imagery.

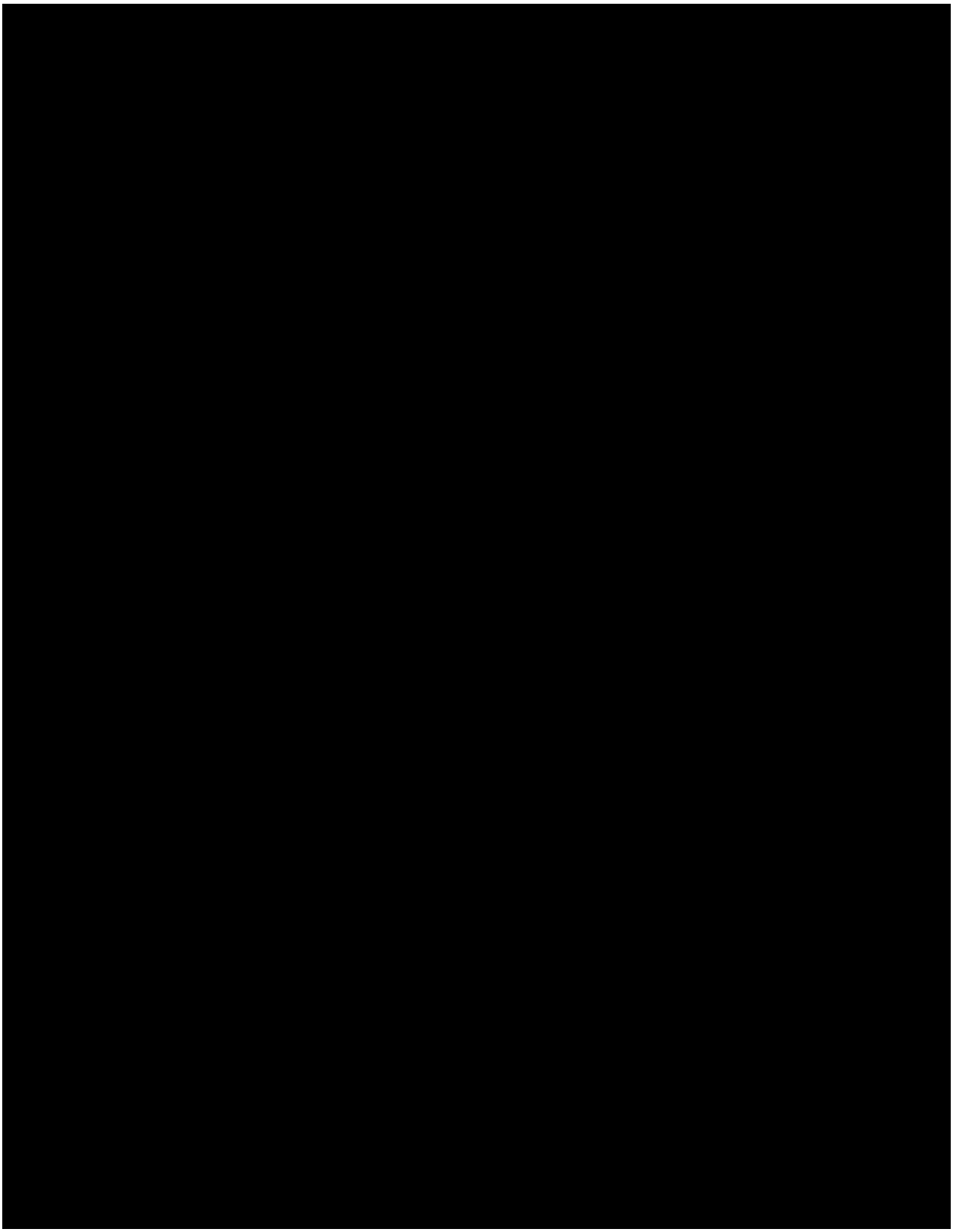

Figure A-4. Results of the background research for previously recorded cultural resources and previously conducted surveys.

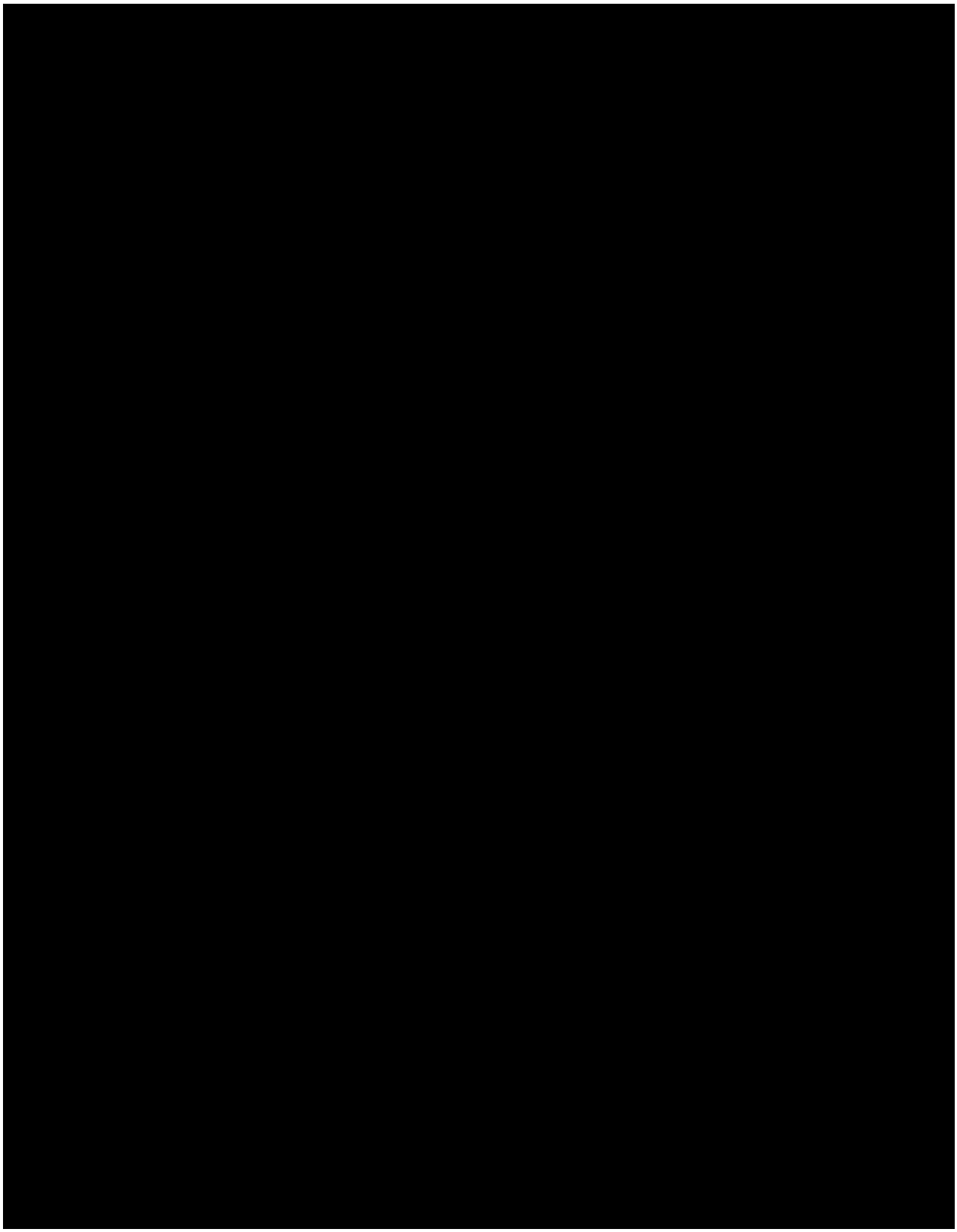

Figure A-5. Results of the background research for postcontact architectural resources and cemeteries.

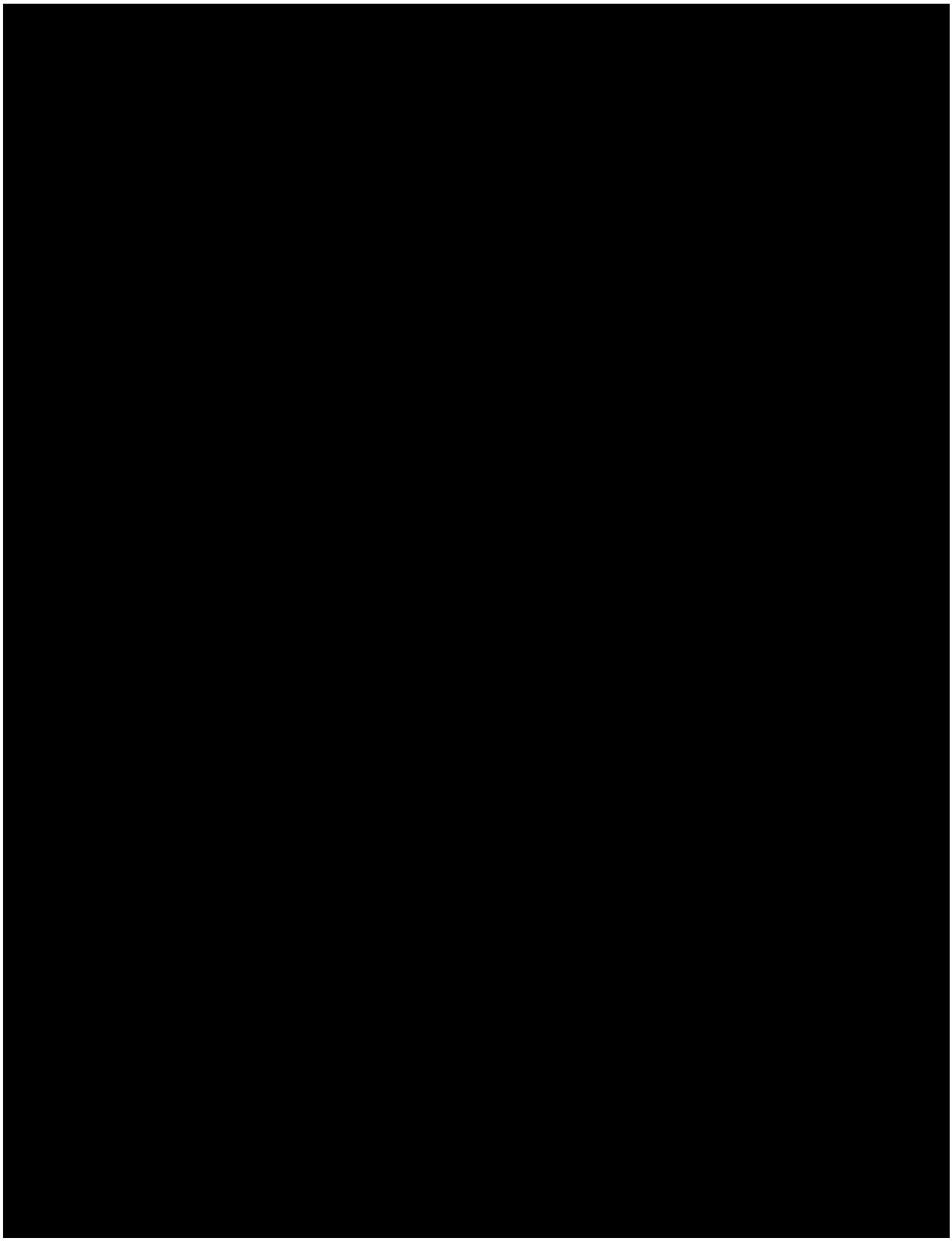

Figure A-6. Areas modeled as having moderate to high potential for deeply buried archaeological deposits in the Project Area and Study Area.

GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
MICHIGAN STRATEGIC FUND
STATE HISTORIC PRESERVATION OFFICE

QUENTIN L. MESSER, JR.
PRESIDENT

September 10, 2025

KEVIN COLE
ROUGET ROAD LLC
10250 PENLAWN DR.
JEROME, MI 49249

RE: SR25-23 PA233 Review Rouget Road, LLC Solar, T07S/R04E/Sec. 7, 8, 9, 15, 16, 17, 20 ,21, 22, 27, 28, 29, 30, 33, and 34, Palmyra Township, Lenawee County (MPSC)

Dear Mr. Cole:

We have received your request for review of the above-cited project under Public Act 233 of 2023 for Renewable Energy and Energy Storage Facility Siting (PA 233) at the above-noted location. We have reviewed the assessment prepared by SWCA, "Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan" and appreciate the information provided. To fully consider and address impacts to cultural and historic sites we require additional information, please send the following:

General

In the materials submitted, the project area boundaries in the submission form and in the Desktop Review do not match. Please ensure that we have the final project boundary maps included in all materials submitted to our office. Desktop Review states that the project plan will avoid archaeological sites, however, the project mapping provided does not make this apparent or clear. We cannot assess the impact of the proposed project on historic resources without accurate mapping information. Additionally, we would like to see the locations of staging areas, vehicle traffic, and any other areas that may have ground disturbance mapped.

Archaeological Resources

Due to the presence of previously documented sites within and near the project area, and the high archaeological sensitivity for the River Raisin valley generally, SHPO requests full archaeological survey for the entire project area, including staging areas. In particular, the boundaries of site 20LE28 are poorly delineated. In order to avoid this site, which is known to contain burials, additional survey methodologies may be necessary beyond pedestrian survey or shovel testing***. SHPO recommends consulting with our office and Tribal Nations with historic connections to this region to develop an appropriate methodology***, which may include geophysical prospection or historic human remains detection dog (HRD) survey. SHPO also recommends developing an Unanticipated Discovery Plan (UDP) for the project. A UDP specifies who will be contacted and what measures will be taken in the event of an unanticipated discovery of archaeological materials or human remains during the project implementation. Please see the UDP template attached, for an example of how these documents are organized. SHPO encourages the project proponent to work with consulting party tribes to develop an

appropriate UDP and protocol for handling human remains.

Above-ground Resources

SHPO concurs with the proposed methodology of utilizing the Above Ground Table in lieu of identification forms except that we require identification forms for properties that are identified as eligible. The table does not provide enough information for eligible properties. For eligible properties, photographs of all resources must also be included in an attachment with Architectural Properties Identification Form. When discussing effects to above-ground resources, please be sure to provide discussion of visual impacts as well as visual barriers in place that may play in to effects determinations. Also be sure that the Historic Resource Survey Report contains enough history and contextual information about the area and resources for SHPO to adequately assess eligibility.

Additional information must be submitted online through our Additional Information Portal.

Please note that our review cannot proceed until we are able to consider the information requested above. This letter is not concurrence. If you have any questions, please contact please contact Senior Archaeologist, Sarah Surface-Evans, surfaceevanss1@michigan.gov, (517) 282-7959 or Historian, Katlyn Burns Yancho, at 517-256-3416, burnsyanchok@michigan.gov. **Please reference our project number in all communication with this office regarding this review.** Thank you for your consultation.

Sincerely,

Sarah Surface-Evans, PhD, RPA
Senior Archaeologist

SES:KAK:KBY:SSE

Enclosure(s): UDP Template

Copy: Anna Gilmer, SWCA

Sault Ste. Marie Tribe of Chippewa Indians, Michigan

From:	Jonathan Libbon
To:	"EDonmyer1@saulttribe.net"
Cc:	Carol Mcknight; Aleyda Galan; Cole, J Kevin; Quarles, Mark; Anna Gilmer
Subject:	Rouget Road Solar Consultation Letter
Date:	Thursday, November 20, 2025 5:00:00 PM
Attachments:	Rouget Tribal Consulation LTR_20Nov2025.pdf image001.png
Sensitivity:	Private

Good Afternoon Emma,

On behalf of Rouget Road Solar Farm LLC, a wholly-owned subsidiary of RWE Clean Energy LLC (RWE), we are reaching out to request your input on the Rouget Road Solar Farm Project, a proposed solar facility in Lenawee County, Michigan. The facility will require a state siting certificate from the Michigan Public Service Commission (MPSC). The attached letter and documentation outline the project and provide details on the cultural resource work completed to date. We are seeking comments from your area of expertise regarding any potential environmental or cultural effects associated with this project.

Please let me or Kevin Cole (cc'd), the project manager from RWE, know if you have any questions about the project.

Thanks,

Jon

Jonathan R. Libbon, RPA | he, him, his
Cultural Resources Director

SWCA Environmental Consultants
80 Emerson Lane, Suite 1306
Bridgeville, Pennsylvania 15017
P 724.316.5547 | O 412.839.1001 ext. 5509

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11/20/2025

Dear Tribal Historic Preservation Officer and/or Tribal Cultural Representative,

As part of its responsibilities under Michigan Public Act 233 of 2023 (PA 233), *Renewable Energy and Energy Storage Facility Siting*, the Michigan Public Service Commission (MPSC) is seeking consultation (as required in PA 233 Section 224.1b[1]) and determining the area of potential effects ("APE") for the proposed project. Federally listed sovereign Nations with an interest in the state of Michigan are invited to review and comment on Rouget Road Solar Farm, LLC's (Rouget Road Solar Farm) (a wholly-owned subsidiary of RWE Clean Energy LLC [RWE]) proposed **Rouget Road Solar Farm Project** (the "Project"). The proposed Project will require a state-siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC (PA 233 Section 226.7b). Although Rouget Road Solar Farm requests a review and comment on the Project, the MPSC is the state agency and may be communicated with directly.

Based on Michigan State Historic Preservation Office (MI SHPO) guidance from their *Instructions for the Application for PA 233 Renewable Energy Storage Facility Siting Consultation Form*:

> "**Public Act 233** requires the applicant for energy siting and storage facilities to consider and address impacts *to the environment and natural resources, including, but not limited to, sensitive habitats and waterways, wetlands and floodplains, wildlife corridors, parks,* ***historic and cultural sites****, and threatened or endangered species*. The applicant must submit this information to the Michigan Public Service Commission (MPSC) for consideration in permitting the project. In order to facilitate considerations of historic and cultural sites (hereafter Historic Properties), the MPSC has required applicants to consult with the State Historic Preservation Office (SHPO)."

This letter is part of the early coordination phase of the environmental review process, requesting comments associated with this Project. We are requesting comments from your area of expertise regarding any possible environmental or cultural effects associated with this Project. Please provide any additional information you may have regarding potential cultural resources in the Project area so they may be accounted for during the environmental review of this Project. This information can be provided directly to RWE or the MPSC.

Project Description

The proposed Project is southeast of the city of Adrian, in Palmyra Township, Lenawee County, Michigan (Figure 1). Historic Mapping places the proposed Project area in Sections 7, 8, 9, 15, 16, 17, 20, 21, 22, 27, 28, 29, 30, 33, and 34 of Township 7 South, Range 4 East as seen on the enclosed USGS 7.5 series for Tecumseh South and Palmyra, Michigan Topographic Quadrangle map (Figure 2). Rouget Road Solar Farm is proposing to construct a 175-megawatt (MW) alternating current (AC) solar photovoltaic power generating facility. The leased area/Project area boundary includes approximately 2,142 acres (867 hectares) (Figures 2 and 3). Construction will require 1,513 acres (612 ha) of what is currently primarily agricultural land (see site plan boundary in Figure 1). Limited tree removal is planned across 7.96 acres (3.22 ha). Proposed work required for the Project includes construction of a switchyard, substations, access

[1] Sections refer to those found at: https://www.legislature.mi.gov/documents/2023-2024/publicact/htm/2023-PA-0233.htm

roads, fencing, MV electrical cabling, and solar panel structures. Construction may also include an operations and maintenance building.

Project Permitting
The proposed Project will require a siting certificate from the MPSC. PA 233 requires the Project proponent to identify and provide information on cultural resources potentially affected by the Project to the MPSC.

PA 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 MW or more, to wind projects with a capacity of 100 MW or more, and energy storage facilities with a capacity of 50 MW or more. Projects that fall into these categories must identify and provide information on the effects of the Project on environmental, natural, and cultural resources. Additional PA 233 information is available online at State Project Reviews | MiPlace[2], and a Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the MPSC is available online at Guide for Involvement by Tribal Governments in Infrastructure Siting Cases at the Michigan Public Service Commission. [3]

Cultural Resource Investigations
The APE is the area in which the proposed Project may cause alterations in the character or use of historic resources. As the site plan boundary includes all locations that may be impacted by ground disturbing activities related to the project undertaking, it is considered the physical APE (see Figure 1). The visual APE for assessing visual effects to historic-age resources is a 0.5-mile buffer from the boundaries of the Project area (e.g., leased area/project boundary) (see Figure 2). This boundary will be modified based on visual intrusions that may obscure the project.

Rouget Road Solar Farm has contracted SWCA Environmental Consultants (SWCA) to conduct the archaeological and architectural history surveys. Due to the presence of previously--documented archaeology sites in and near the Project area, and the archaeological sensitivity for the River Raisin Valley, SWCA will conduct a full archaeological survey for the physical APE, including staging areas. The boundaries of [redacted], is mapped as lying within the proposed Project area; however, these site boundaries are mapped based off archival records and the extent of the complex is poorly understood. In order to be sensitive toward this [redacted], we are asking for your input on the extent of the complex and the survey methodologies that may be necessary beyond [redacted] An Unanticipated Discoveries Plan (Exhibit A-1.14 in the MPSC permit application) has been prepared.

Summary of Requested Action
We look forward to consulting with your office on this Project and to a continued dialogue. We ask that you provide any comments regarding the Project area following your review of the enclosure. Please use the above Project name and Project description in your reply.

In summary, the MPSC and Rouget Road Solar Farm are requesting Tribal Governments to:

[2] https://www.miplace.org/historic-preservation/programs-and-services/cultural-resource-management-and-planning/state-project-reviews/

[3] https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/consumer/MPSC_Tribal_Involvement_Guide.pdf?rev=399582a67fbe46e883e6f21d1325e785&hash=AA471378E81539AFBBA758AB04FB3D25

1. Review the Project information.
2. Identify cultural or environmental concerns.
3. Provide feedback on archaeological methodologies (especially near site 20LE28).
4. Ensure that any cultural resources are addressed in the MPSC permitting process.

All comments will be documented and considered in Project design and the forthcoming MPSC state siting process. Consultation with SHPO and the THPOs included in the distribution list below will be incorporated into the cultural survey plan, recordation, and design updates as needed. Your timely response will greatly help us incorporate your concerns into the development of the Project. For that purpose, we request that you provide comments by December 20, 2025.

Tribal consulting parties may respond to myself (Kevin Cole) at rougetroadsola@rwe.com with any comments or concerns. Alternatively, you can reach out directly to Gustavo Cordero at the MPSC at corderog@michigan.gov.

Respectfully,

Kevin Cole
RWE Development Manager
rougetroadsola@rwe.com

cc: Gustavo Cordero, Michigan Public Service Commission
Carol McKnight, SWCA Environmental Consultants
Anna Gilmer, SWCA Environmental Consultants

Distribution List:
Forest County Potawatomi Community, Wisconsin
Hannahville Indian Community, Michigan
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
Little Traverse Bay Bands of Odawa Indians, Michigan
Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan
Menominee Indian Tribe of Wisconsin
Miami Tribe of Oklahoma
Pokagon Band of Potawatomi Indians, Michigan and Indiana
Sault Ste. Marie Tribe of Chippewa Indians, Michigan
Seneca-Cayuga Nation

Enclosures:
1. Figures
    a. Figure 1: State location map
    b. Figure 2: Portions of the USGS 7.5' series Tecumseh South and Palmyra Michigan Topographic Quadrangles showing the Project area.
    c. Figure 3: Aerial view of the Project area location in Palmyra Township, Lenawee County, Michigan.
2. Cultural Desktop Report
3. SHPO PA233 Response

Figure 1. Location of the proposed Rouget Road Solar Project Area in Michigan.

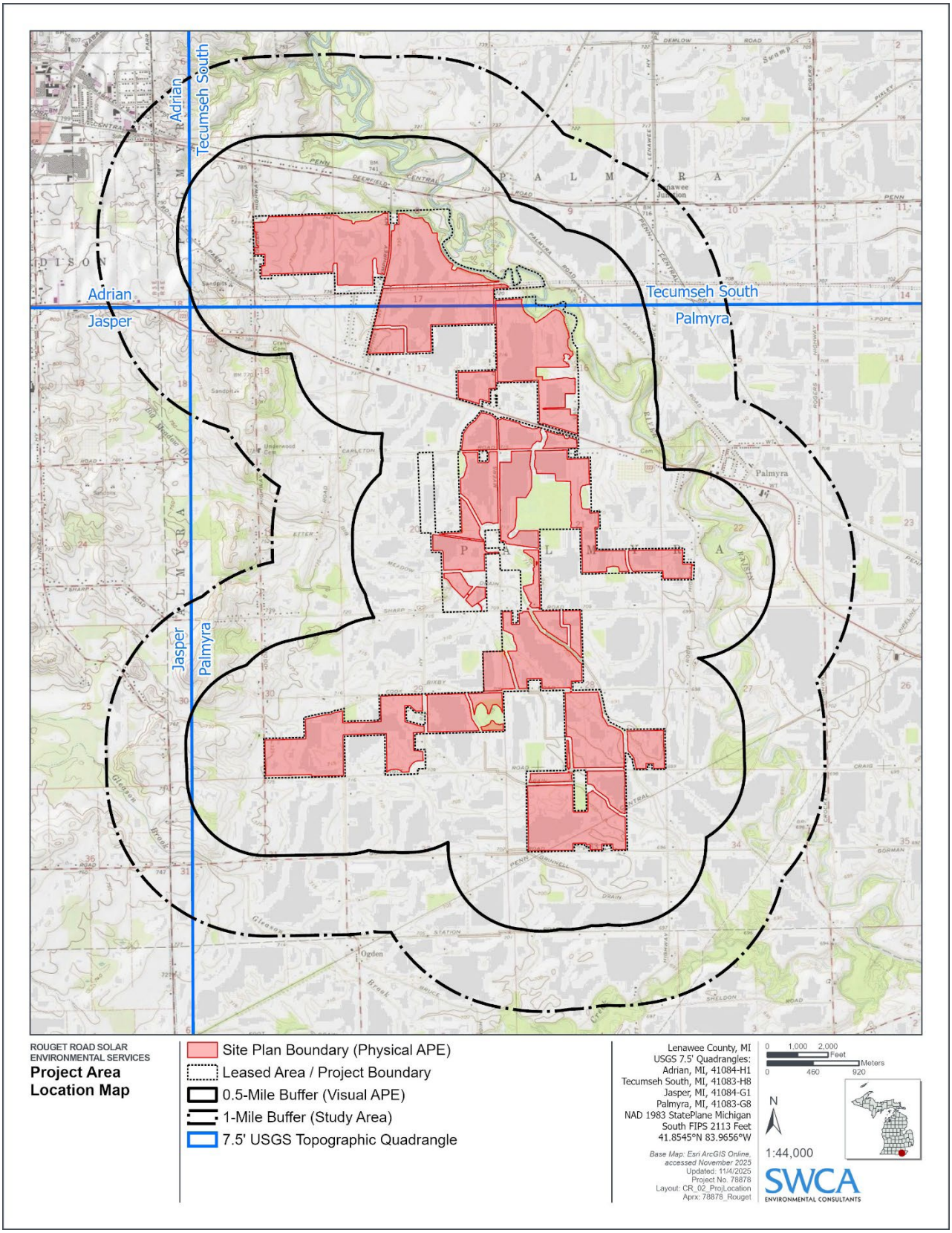

Figure 2. Portions of the USGS 7.5' series Tecumseh South and Palmyra, Michigan Topographic Quadrangles showing the site plan boundary and leased area/Project boundary.

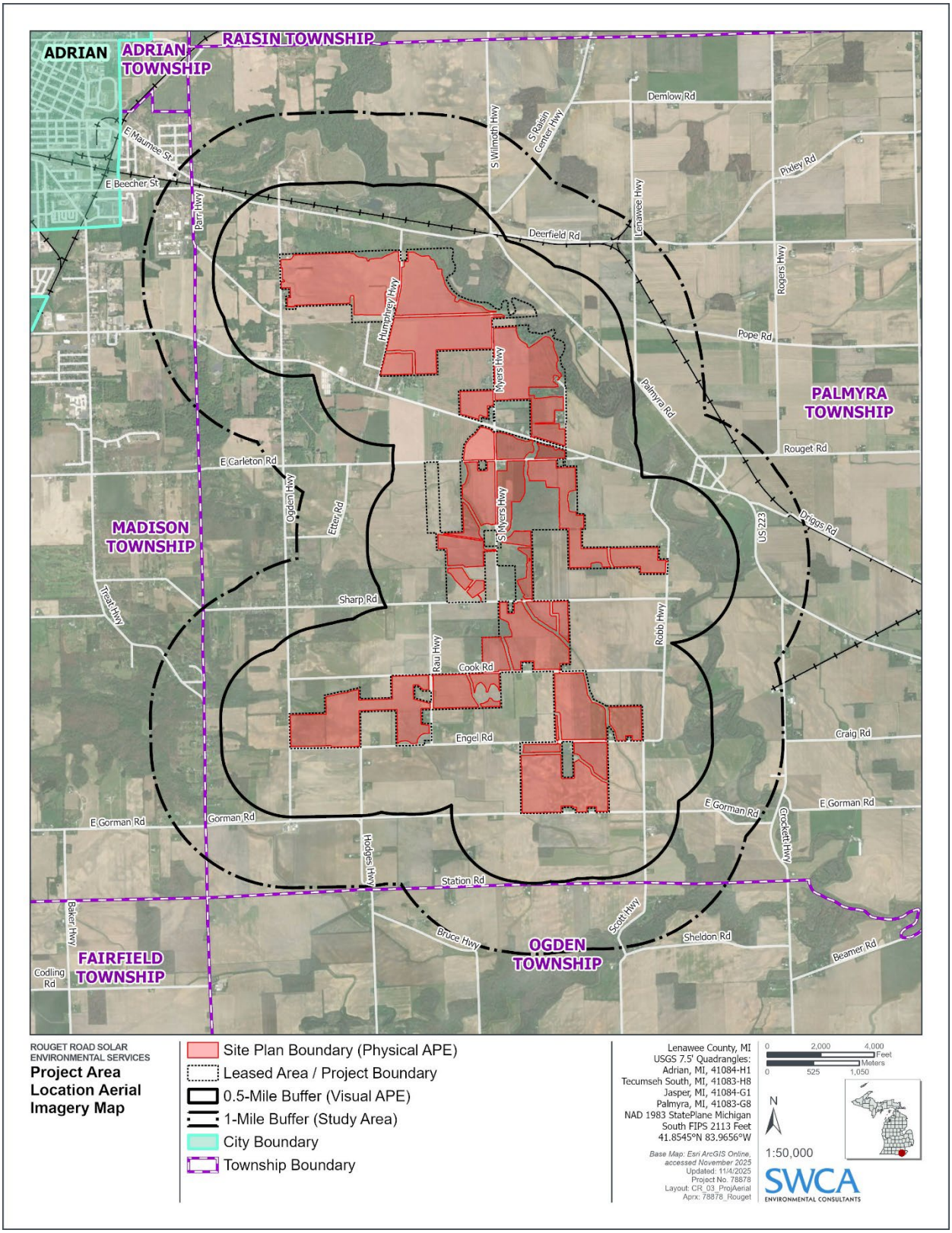

Figure 3. Aerial view showing the site plan boundary and leased area/Project boundary in Palmyra Township, Lenawee County, Michigan.

Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan

JANUARY 2025

PREPARED FOR

Rouget Road, LLC

PREPARED BY

SWCA Environmental Consultants

CULTURAL RESOURCES DESKTOP REVIEW FOR THE ROUGET ROAD, LLC LENAWEE COUNTY, MICHIGAN

Prepared for

Rouget Road, LLC
353 North Clark Street, 30th Floor
Chicago, Illinois 60654
Attn: J Kevin Cole

Prepared by

Rachel Lawrence, M.A., RPA
Heather MacIsaac, B.A.

and

Anna Gilmer, M.A., RPA

SWCA Environmental Consultants
200 22nd Street, Suite 220
Lombard, Illinois 60148
(630) 705-1762
www.swca.com

SWCA Project No. 78878

SWCA Cultural Resources Report No. 25-27

January 2025

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1 INTRODUCTION

SWCA Environmental Consultants (SWCA) completed a cultural resources desktop review for the proposed Rouget Road, LLC (project), located in Lenawee County, Michigan (Figure A-1 in Appendix A). The Project Area spans approximately 2,490 acres (1,008 hectares) of privately owned land near the towns of Adrian, Palmyra, and Ogden. SWCA completed the desktop review for the Project Area plus a surrounding 1.0-mile (1.6-kilometer) buffer around the Project Area. The surrounding 1.0-mile buffer is henceforth referred to as the Study Area (Figures A-2 and A-3).

The objective of the desktop review was to identify existing cultural resources within the Project Area and Study Area to inform project facility siting. Additionally, the Study Area was evaluated to gain an understanding of the type and density of cultural resources in the vicinity of the Project Area. This report summarizes the methods SWCA used to complete the desktop review and presents the results of the background research. It does not serve as Section 106 clearance for the proposed project.

2 REGULATORY FRAMEWORK

Projects in Michigan can come under the purview of two primary cultural resources regulations, the National Historic Preservation Act (NHPA) and Michigan's Natural Resources and Environmental Protection Act. Both are administered by the Michigan State Historic Preservation Office (MI SHPO).

If the project is deemed a federal undertaking (requiring a federal permit, license, or approval; being located on federally owned or managed land; or receiving federal financial assistance), a cultural resources survey most likely would be mandated to ensure compliance with Section 106 of the NHPA. The scope of required cultural resources surveys would then be determined by the functioning federal lead agency in cooperation with the MI SHPO and, if applicable, the pertinent Tribal Historic Preservation Offices as defined in both Section 101 of the National Environmental Policy Act and Section 106 of the NHPA.

Under Michigan law, the state oversees all archaeology performed on state land. The Natural Resources and Environmental Protection Act (Public Act 451 of 1994, Part 761) requires that a permit be obtained prior to undertaking any archaeological investigation on state land.

Public Act 233, which created a statewide process to permit solar, wind, and battery projects across the state and took effect November 29, 2024, applies to solar projects with a nameplate capacity of 50 megawatts or more, to wind projects with a capacity of 100 megawatts or more, and to energy storage facilities with a capacity of 50 megawatts or more. Public Act 233allows developers the option of applying to the Michigan Public Service Commission (MPSC) to construct utility-scale renewable energy facilities if the local unit of government does not have a compatible renewable energy ordinance. If a compatible renewable energy ordinance is in place, the developer must apply with the local unit of government first, but if the project is denied, the developer may submit to the MPSC for approval. Projects that fall into these categories must identify and provide information on the effects of the project on environmental, natural, and cultural resources.

The project will occur solely on privately held land; thus, no state or local laws requiring archaeological investigations or surveys are anticipated to apply for this project. However, Public Act 233 requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC.

3 METHODOLOGY

SWCA initially submitted a request for in-person research to the MI SHPO on April 7, 2023. Staff at the MI SHPO approved the request and scheduled a research appointment for April 20, 2023. An SWCA archaeologist obtained information in person on previous cultural resources surveys, previously recorded archaeological resources, and previously recorded postcontact architectural resources within the Study Area.

As the Project Area and Study Area were revised in fall 2024, SWCA submitted a second request to the MI SHPO for archaeology and survey site files within the revised Study Area. MI SHPO provided all available records on December 9, 2024. Due to the ongoing updates to the MI SHPO's database, a process that was initiated on February 24, 2024, only archaeology files are currently available. Postcontact architecture files and both postcontact architectural and archaeological survey reports are not currently available as the MI SHPO are scanning these files for upload into a new database. As such, SWCA relied on the April 2023 postcontact architectural resource files and survey reports for this review. SWCA additionally reviewed the National Register of Historic Places (NRHP) database for Michigan as the best available recent data regarding architectural resources.

In addition to the site file search, SWCA investigated historic plat and topographic maps and historic aerial imagery of the Project Area and Study Area. SWCA also researched environmental factors such as modern and historic land use and soil units mapped by the Natural Resources Conservation Service (NRCS) to determine the likelihood of the project to encounter previously unrecorded precontact or postcontact archaeological resources.

4 RESULTS

4.1 Physiography, Geology, and Soils

The Project Area is situated within the Erie-Huron Lake Plain of the Eastern Lake section of the Central Lowland province of the Interior Plains (NRCS 2022:343). The Erie-Huron Lake Plain is a fairly level glacial lake plain with scattered sandy ridges formed by former shorelines and moraines. Elevation ranges from approximately 570 to 815 feet (175 to 250 meters [m]), whereas local relief averages 10 feet (3 m). Major confluences in the Erie-Huron Lake Plain include the Clinton, Huron, and Saginaw Rivers, which empty into the Great Lakes. The Project Area is located within the Floodwood Creek-River Raisin watershed and the Big Meadow Drain-Black Creek watershed, which empty into the River Raisin (U.S. Environmental Protection Agency 2023). Mississippian- to Silurian-age limestone, shale, and dolomite are common along the surface and along the shores of Lake Erie and Lake Huron. Broad, level, and somewhat poorly drained lake plains feature American beech, sugar maple, silver maple, green ash, pin oak, swamp white oak, and American elm, whereas sandy areas feature eastern white pine, eastern hemlock, and other coniferous trees (NRCS 2022:344).

This ecoregion is also part of the Maumee Lake Plain and the Ann Arbor Moraines sub-subsections. The Maumee Lake Plain is a broad, flat, glaciated clay lake plain with rich, loamy soils deeply mantled by till and outwash and dissected by broad glacial drainageways containing sandy soils (Albert 1995). This region formerly included beech-sugar maple forest, elm-ash forest, deciduous swamps, white oak-black oak savannas, wet prairies, and coastal marshes, but now has been largely cultivated (Albert 1995; NRCS 2022). The Ann Arbor Moraines sub-subsection is a long, narrow band of fine- and medium-textured end and ground moraine bordered by flat lake plain on the east and by sandy outwash, end moraine, and ice-contact features to the west. This region formerly supported oak and oak-hickory forests, with oak

savannas along the western edge (Albert 1995). Major wildlife species in the Erie-Huron Lake Plain area include white-tailed deer; cottontail rabbits; squirrels; raccoons; pheasants; bobwhite quail; songbirds; various species of snakes, frogs, and turtles; sunfish; perch; bass; walleye; catfish; carp, sucker; and northern pike.

There are 40 soil series mapped within the Project Area by the NRCS (Table 1). The soils range from very poorly drained to excessively drained loams to sandy loams. The most common soils for the Project Area include Brady and Macomb loams, 0 to 3 percent slopes; Colwood very fine sandy loam, 0 to 3 percent slopes; Wauseon loam, 0 to 3 percent slopes; Ziegenfuss clay loam, 0 to 1 percent slopes; Brady and Macomb sandy loams, 0 to 3 percent slopes; and Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes. These soil types, and their implication for site formation processes and archaeological potential, are discussed further in Section 4.6.

Table 1. Soils within the Project Area

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
BbA	Berrien loamy sand, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BbB	Berrien loamy sand, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcA	Berrien sandy loam, 0 to 3 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BcB	Berrien sandy loam, 3 to 7 percent slopes	Moderately well drained	Strand plains on till-floored lake plains	Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till
BhA	Brady sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on strand plains	Loamy over sandy and gravelly glaciofluvial deposits
BkA	Brady and Macomb loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Strand plains on till-floored lake plains	Loamy over sandy glaciolacustrine deposits
BnA	Bronson sandy loam, 0 to 3 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BnB	Bronson sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on strand plains	Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
BoA	Brookston loam, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Loamy till
CbB	Cadmus sandy loam, 3 to 7 percent slopes	Moderately well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over loamy till
CeA	Colwood very fine sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	Poorly drained	Depressions on deltas	Stratified loamy glaciofluvial deposits
CgA	Conover loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Loamy till
GbA	Genesee sandy loam, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
GcA	Genesee and Eel loams, 0 to 3 percent slopes	Well drained	Knolls on flood plains	Loamy alluvium
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GgA	Griffin and Sloan loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Meander scars on flood plains	Loamy alluvium
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	Very poorly drained	Depressions on till plains	Clayey till
KbC	Kendallville sandy loam, 7 to 15 percent slopes	Well drained	Knolls on ice-contact slopes	Loamy glaciofluvial deposits over till
KeA	Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on deltas	Stratified loamy glaciofluvial deposits
LcA	Linwood muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Wood organic material over loamy till
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	Somewhat poorly drained	Drainageways on till-floored lake plains	Sandy and/or loamy glaciofluvial deposits over loamy till
NaA	Nappanee silt loam, 0 to 3 percent slopes	Somewhat poorly drained	Knolls on till plains	Clayey till
NbB	Nappanee loam, 3 to 7 percent slopes	Somewhat poorly drained	Knolls on ground moraines	Clayey till
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	Somewhat poorly drained	Knolls on ground moraines	Clayey till
OcC	Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded	Excessively drained	Beaches on till-floored lake plains	Glaciofluvial deposits and/or sandy glaciolacustrine deposits over loamy till
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	Poorly drained	Depressions on till plains	Loamy till
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PdB	Plainfield and Berrien loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PeB	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes	Excessively drained	Strand plains	Sandy glaciofluvial deposits
PwmaaA	Pewamo clay loam, dense substratum, 0 to 1 percent slopes	Poorly drained	Drainageways on nearshore zones (relict), flats on nearshore zones (relict)	Clayey till over dense till
RbA	Rollin muck, 0 to 3 percent slopes	Very poorly drained	Depressions on till-floored lake plains	Herbaceous organic material over marl
SbA	Sebewa sandy loam, 0 to 3 percent slopes	Poorly drained	Depressions on glacial drainage channels	Loamy over sandy and gravelly glaciofluvial deposits
Sf	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	Poorly drained	Drainageways on stream terraces, drainageways	Loamy drift over sandy and gravelly outwash
WcA	Wauseon loam, 0 to 3 percent slopes	Poorly drained	Depressions on till-floored lake plains	Glaciolacustrine deposits over clayey till

Map Unit Symbol	Map Unit Name	Drainage	Associated Landform(s)	Parent Material
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	Poorly drained	Wave-worked till plains	Clayey till over loamy till
W	Water	N/A	N/A	N/A

Source: NRCS (2024).

4.2 Historical Land Use

SWCA reviewed historic plat and topographic maps, as these sources provide information on past land use within the Project Area and Study Area that may indicate the probability of encountering significant precontact and postcontact cultural resources in or near the Project Area. The historic maps indicate that there has been a general consistency in the road network and land-use patterns from the late nineteenth century into the modern era in the Study Area.

The earliest available map of the Project Area is an 1819 General Land Office survey map (Bureau of Land Management General Land Office 2024). The Project Area is uninhabited. The River Raisin is drawn as a winding water course east of the Project Area. There are patches of marshlands, and tributaries are marked but not fully drawn. No structures are depicted. Palmyra and Lenawee Junction have not yet been established.

The first available plat map, dated 1874, shows that the Project Area and Study Area had been divided into large landholdings. Residences, schools, and churches are depicted. Roads and three railroads also are in place, including the Lenawee County Railroad and Palmyra Road. The current U.S. Highway 233 is shown as a railroad. Several structures are depicted on landholdings within the Project Area. Some of these structures are adjacent to orchards or small agricultural fields. There are branches of unnamed tributaries flowing throughout the Project Area, one of which is the modern Big Meadow Drain (Everts and Stewart 1874).

By 1893, the Project Area is depicted similarly to the 1874 plat. More landowners have appeared, represented by smaller landholdings, and structures are depicted within the Project Area. The unnamed tributaries are still depicted, running through the central and southern portions of the Project Area (Cadwell 1893).

The 1916 plat map shows an increase in landowners once more as the communities of Lenawee Junction and Palmyra continue to grow. Structures also are depicted on these parcels in the Project Area and are shown mostly along roads. U.S. Highway 233 is depicted as the Toledo Western electric railroad. There is another railroad that runs north-south to the Toledo Western electric railroad, connecting from Adrian to Palmyra within the Project Area. This segment of rail had been a road on the 1874 and 1893 plat maps. Several tributaries also are shown within the Project Area (Ogle 1916).

The 1921 plat map does not show individual structures beyond churches and schools, neither of which are in the Project Area. Landowner names are given, and the road network and railroads appear in the same location as on previous plats (*Adrian Daily Telegram* 1921). The 1928 plat presents the same information (*Adrian Daily Telegram* 1928).

SWCA also reviewed historic topographic maps to determine the land use of the Project Area and Study Area. Four historic topographic maps from 1939 to 1972 show that there has been little development from the early twentieth century to the present (U.S. Geological Survey [USGS] 2024). On the earliest available topographic map (Blissfield, Michigan, 1939, 1958 edition), multiple structures are shown in the

Project Area along roadways. The tributaries shown on the plat maps are named and shown: Big Meadow Drain, Bixby Drain, and Grinnell Drain. The road network and railroads are also depicted. The 1941 Blissfield, Michigan, topographic map reveals a similar image. The 1972 Palmyra, Michigan, and 1972 Tecumseh South, Michigan, topographic quadrangles name most of the roads in the Project Area, and they show that residential development had not increased outside of Palmyra and Adrian. Transmission and telecommunication cables are also depicted (USGS 2024).

A review of 17 aerial photographs taken between 1955 and 2022 indicates that minimal land development occurred within the Project Area and its environs. On the aerial images beginning in 1955, the landscape is agricultural. Isolated farmsteads are visible along roadways outside of Palmyra, Lenawee Junction, and Adrian. Drainages are visible either as scars on the landscape or are lined with trees, as is the River Raisin. There are some stands of trees throughout the Project Area. Between 1955 and 2022, no noticeable changes occur to the land use in the Project Area or Study Area (Historic Aerials 2024).

4.3 Previous Cultural Resources Surveys

A review of MI SHPO records identified one cultural resources survey that was conducted in the Project Area and two cultural resources surveys conducted within the Study Area (Table 2). Project ER00-7.17.161134 was a reconnaissance investigation conducted in 2017 by Archaeological Consultants of Ossian. The survey area covered 0.44 acre of land, and no cultural resources were identified during the survey (Stillwell 2017). Project ER17-391 was conducted for the Howard Street/West Michigan CMAQ and Rehabilitation project; however, the MI SHPO records did not contain information on the surveyors, year, or report title. Project B17-258, identified on quad maps in the MI SHPO research repository as Lauterbur 2016, was a Phase I archaeological survey conducted in support of the replacement of the River Raisin Bridge in Palmyra, Michigan. The MI SHPO records did not include information on the extent of the survey; however, no archaeological sites were identified during the survey.

Table 2. Previous Cultural Resources Surveys in the Study Area

Project ID	Project Name	Survey Year	Surveyors	Report Title	Location
ER00-7.17.161134	G2 Cellular Tower Site Review #161134	2017	Archaeological Consultants of Ossian	*An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project #161134) in Palmyra, Lenawee Conty, Michigan. 17FR29Mi.*	Project Area
ER17-391	Howard Street/ West Michigan CMAQ and Rehabilitation	None recorded	None recorded	None recorded	Study Area
B17-258	Lauterbur 2016	2016	Michigan Department of Transportation	*Archaeological Investigations at US-223 River Raisin Bridge Replacement, Palmyra, Lenawee County.*	Study Area

4.4 Previously Recorded Archaeological Sites

[redacted]

[redacted]

4.5 Previously Recorded Architectural Resources and Cemeteries

SWCA reviewed the National Park Service's NRHP database for Lenawee County, Michigan, regarding information on historic districts, buildings, archaeological sites, and other properties eligible for or listed in the NRHP. The NRHP database did not identify any NRHP-listed resources within the Project Area (National Park Service 2024).

SWCA also reviewed historic architecture data provided by the MI SHPO in April 2023. No previously recorded architectural resources are located within the Project Area; three architectural resources are located in the Study Area (Table 4; Appendix A: Figure 5).

No recorded cemeteries are present in the Project Area; two postcontact cemeteries (Palmyra Village Cemetery and Crane Cemetery) are located within the Study Area (Table 5; Appendix A: Figure 5). Palmyra Village Cemetery was included in the MI SHPO site file data, while Crane Cemetery was identified through archival research of historic topographic maps. Due to the data gap in the MI SHPO site file records since February 2024, it is not clear if Crane Cemetery is still absent from MI SHPO site file records.

Table 4. Previously Recorded Historic Architectural Resources in the Study Area

Site ID	Historic Name	City	NRHP Status	Location
P23943	Palmyra Presbyterian Church	Palmyra	Unevaluated	Study Area
P61449	Bruce Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area
P61451	Scott Highway Bridge over Black Creek	Ogden Township	Unevaluated	Study Area

Table 5. Previously Recorded Cemeteries in the Study Area

Historic Name	Record Source	Location
Palmyra Village Cemetery	MI SHPO site file data	Study Area
Crane Cemetery	Archival research	Study Area

4.6 Geoarchaeology

Geoarchaeology, which is a multidisciplinary field that incorporates topography, geomorphology, geology, and soils, helps archaeologists to understand how geological processes have influenced the preservation of archaeological sites. Research conducted by Monaghan and Lovis (2005) demonstrates that deeply buried soils have an increased probability of sustaining cultural resources where fluvial deposits overlie alluvial deposits as a result of waterways breaching their banks. Monaghan and Lovis developed a predictive geoarchaeological model that takes these effects into account and classifies an area's likelihood of having cultural resources from Low to High-Very High.

Based on the Monaghan and Lovis (2005) model, the Project Area intersects with areas modeled as having moderate to high potential for deeply buried archaeological deposits (Figure A-6). [redacted] Otherwise, the remainder of the Project Area is largely mapped as exhibiting a low potential for deeply buried archaeological deposits.

[redacted]

4.7 Cultural Resources Context and Potential

The potential of the Project Area to contain cultural resources was developed through examination of the natural and topographical characteristics of the Project Area and available historic-era maps and aerial photographs.

4.7.1 Potential for Precontact Archaeological Sites

[redacted]

4.7.2 Potential for Postcontact Archaeological Sites

[redacted]

5 SUMMARY AND RECOMMENDATIONS

In summary, the records review established that one cultural resources survey has been conducted previously within the Project Area, and two cultural resources surveys have been conducted in the Study Area. These compliance surveys were negative and did not result in the recordation of cultural resources within the Project Area or the Study Area. However, [redacted] None of the archaeological sites within the Project Area have been evaluated for listing in the NRHP. There are no previously recorded architectural resources within the Project Area and three architectural resources in the Study Area. Based on MI SHPO records and a review of the NRHP, there are no NRHP-listed resources located within the Project Area or Study Area.

There is an overall moderate probability for significant precontact archaeological sites and a low to moderate probability for significant postcontact archaeological sites within the Project Area. [redacted]

Should the project require archaeological survey, the geoarchaeological modeling (Monaghan and Lovis 2005) suggests that shovel testing and/or deep testing (e.g., auguring) may be necessary [redacted] Pedestrian survey is a viable survey methodology as long as alluvial soils are confined to the plow zone (e.g., 12 inches [30 centimeters]); the limits of shovel testing is typically 3 feet (1 m).

Based on the MPSC regulations and our communications with the MI SHPO (personal communication, Sarah Surface-Evans and Scott Slagor, January 30, 2025), SWCA recommends initiating consultation with the MI SHPO. SWCA understands that MI SHPO has initiated a new consultation process for projects subject to permitting through the MPSC, and that the MI SHPO will provide expert testimony regarding cultural resources to the MPSC. To initiate the consultation process, the MI SHPO requests developers to complete a consultation application, in coordination with a professional archaeologist and architectural historian, The MI SHPO will provide their recommendations for next steps, including survey and avoidance requirements. SWCA understands that RWE will have 1 year after submittal of the MPSC permit application to obtain the approval of survey reports or recommendations submitted to the SHPO.

In keeping with Public Act 233, which requires the project proponent to identify and provide information on cultural resources potentially affected by the project to the MPSC, SWCA recommends this document be provided to the MPSC for review. Approval from the MPSC is required before development within the boundaries of these sites occurs.

6 REFERENCES CITED

Adrian Daily Telegram. 1921. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21190/Palmyra+Township/Lenawee+County+1921/Michigan/. Accessed November 14, 2024.

———. 1928. Atlas and Plat Book of Lenawee County, Michigan. *Adrian Daily Telegram*, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/1610467/Palmyra+Township++Raisin+River/. Accessed November 14, 2024.

Albert, Dennis A. 1995. Regional landscape ecosystems of Michigan, Minnesota and Wisconsin: A working map and classification. General Technical Report NC-178. U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota. Available at: https://www.nrs.fs.usda.gov/pubs/gtr/other/gtr-nc178/index.html. Accessed November 1, 2024.

Bureau of Land Management General Land Office. 2024. Original Survey Plat, Township 7 North, Range 4 East, 3rd Principal Meridian. Available at: https://glorecords.blm.gov/details/survey/default.aspx?dm_id=27676&sid=usa5y3jo.a4o#surveyDetailsTabIndex=0. Accessed November 14, 2024.

Cadwell, George D. 1893. Atlas of Lenawee County, Michigan. Geo. D. Cadwell and Company, Adrian, Michigan. Available at: https://historicmapworks.com/Map/US/21077/Palmyra+Township/Lenawee+County+1893/Michigan/. Accessed November 14, 2024.

Everts and Stewart. 1874. Combination Atlas Map of Lenawee County, Michigan. Everts and Stewart, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/20906/Palmyra+Township/. Accessed November 14, 2024.

Historic Aerials. 2024. Historic Aerials Viewer. Available at: https://www.historicaerials.com/viewer. Accessed November 14, 2024.

Monaghan, G. William, and William A. Lovis. 2005. *Modeling Archaeological Site Burial in Southern Michigan: A Geoarchaeological Synthesis*. Michigan State University Press, East Lansing.

National Park Service. 2024. National Register of Historic Places Database and Research. Available at: https://www.nps.gov/subjects/nationalregister/database-research.htm. Accessed January 13, 2025.

Natural Resources Conservation Service (NRCS). 2022. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. Washington, D.C.

———. 2024. Custom Soil Report. Available at: http://websoilsurvey.nrcs.usda.gov. Accessed December 12, 2024.

Ogle, George A. 1916. Standards Atlas of Lenawee County, Michigan. Geo. A. Ogle Publishers and Engravers, Chicago, Illinois. Available at: https://historicmapworks.com/Map/US/22243/Palmyra+Township/Lenawee+County+1916/Michigan/. Accessed November 14, 2024.

Stillwell, Larry N. 2017. *An Archaeological Field Reconnaissance of a Proposed Telecommunications Facility (Project No. 161134) in Palmyra, Lenawee County, Michigan*. Archaeological Consultants of Ossian. On file at the Michigan State Historic Preservation Office, Lansing, Michigan.

U.S. Environmental Protection Agency. 2023. How's My Waterway Viewer. Available at: https://mywaterway.epa.gov/. Accessed November 14, 2024.

U.S. Geological Survey (USGS). 2024. National Geologic Map Database Project TopoView. Available at: https://ngmdb.usgs.gov/topoview/viewer/#14/41.8731/-83.9695. Accessed November 14, 2024.

APPENDIX A

Figures

Figure A-1. Location of the proposed Rouget Road, LLC Area in Michigan.

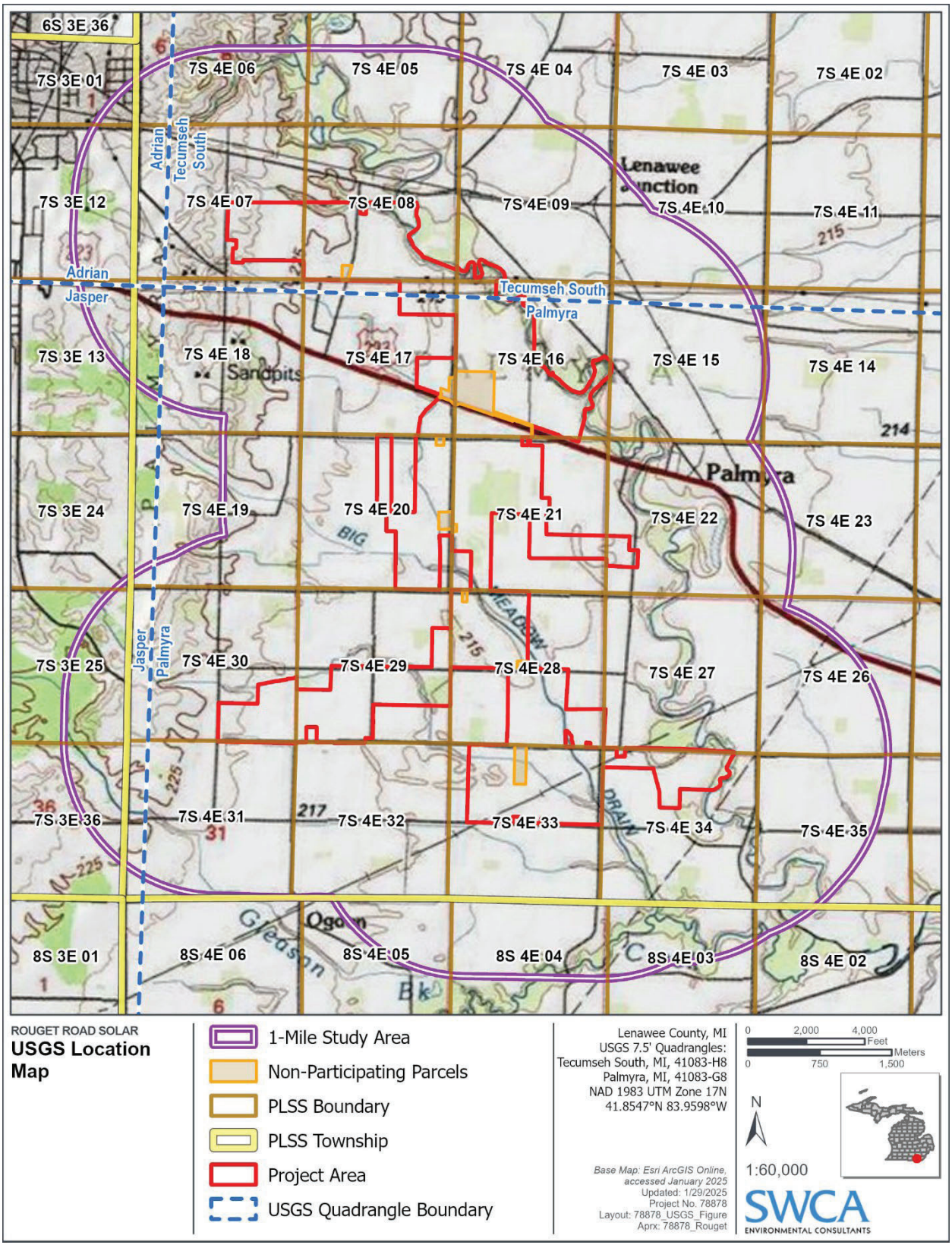


Figure A-2. Location of the Study Area for the proposed Rouget Road, LLC on a USGS topographic map.

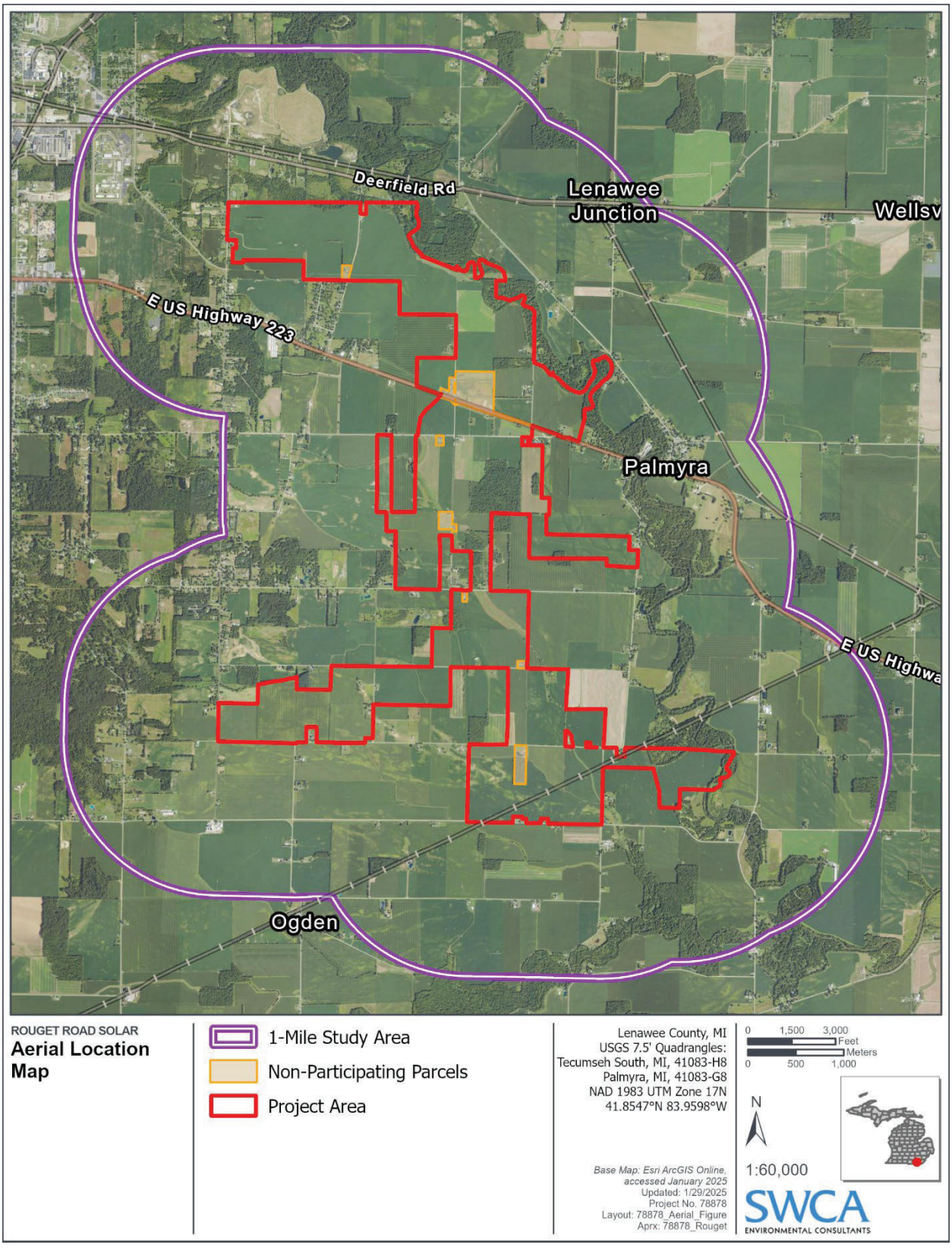


Figure A-3. Overview of the Study Area for the proposed Rouget Road, LLC on aerial imagery.

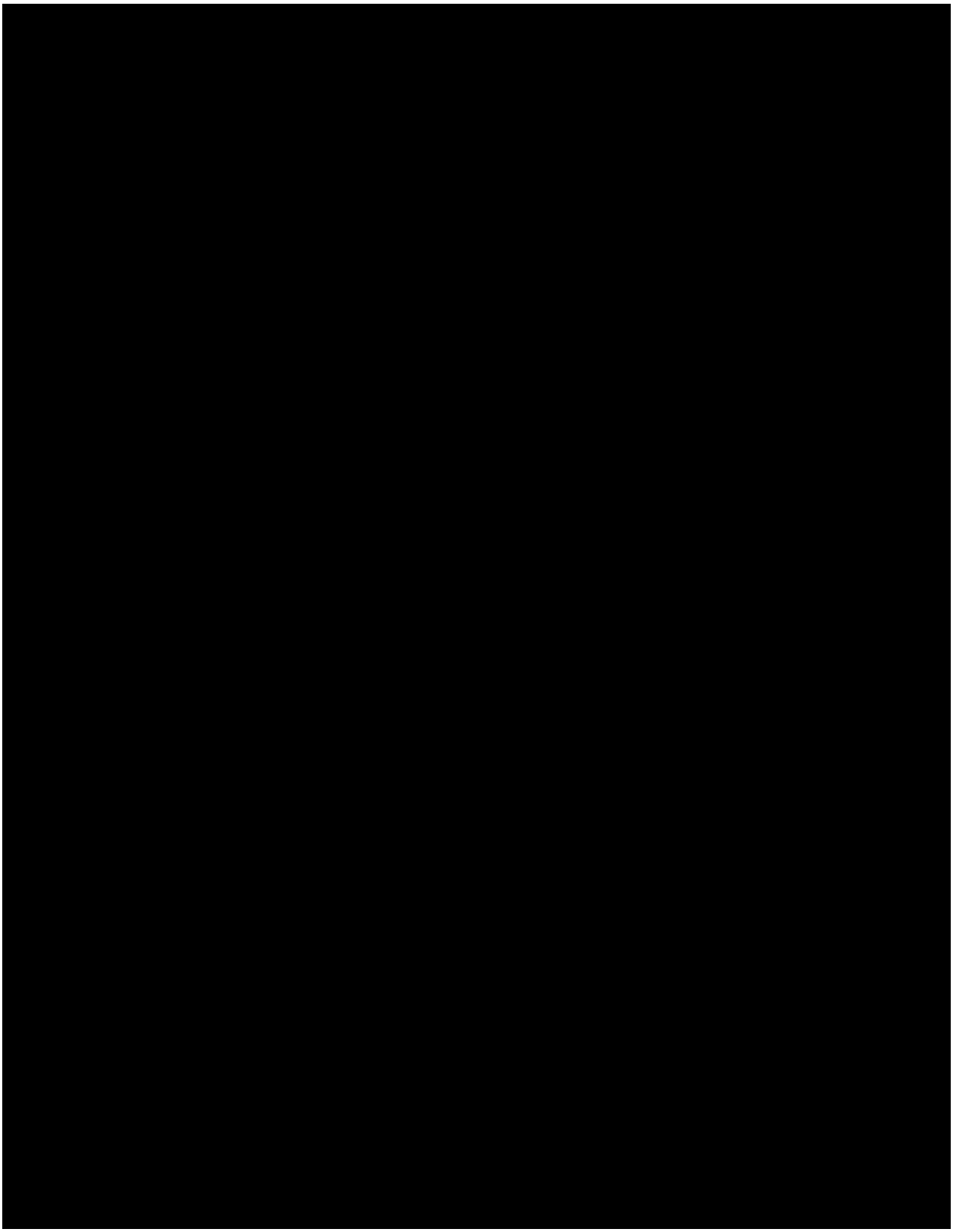


Figure A-4. Results of the background research for previously recorded cultural resources and previously conducted surveys.

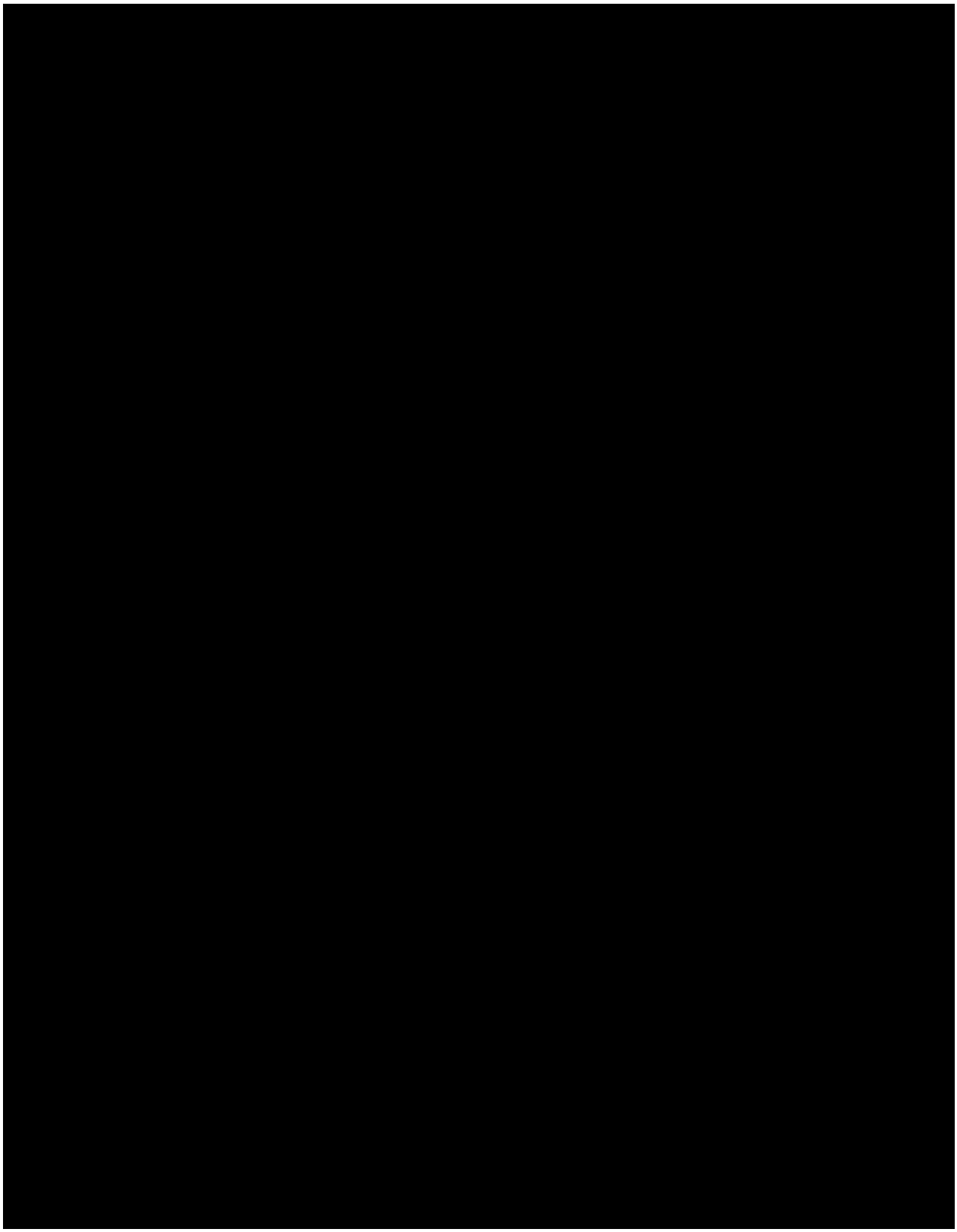


Figure A-5. Results of the background research for postcontact architectural resources and cemeteries.

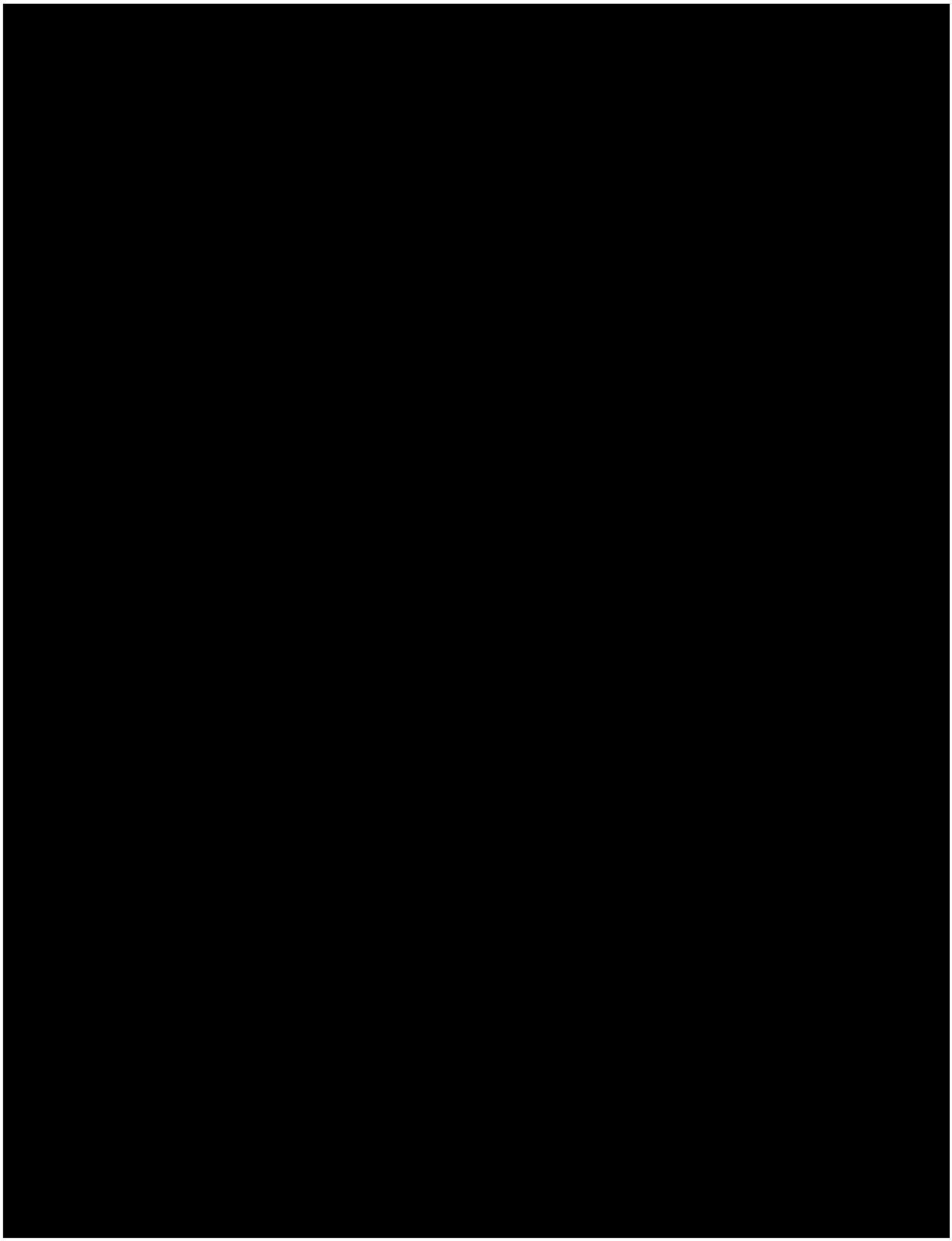


Figure A-6. Areas modeled as having moderate to high potential for deeply buried archaeological deposits in the Project Area and Study Area.

GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
MICHIGAN STRATEGIC FUND
STATE HISTORIC PRESERVATION OFFICE

QUENTIN L. MESSER, JR.
PRESIDENT

September 10, 2025

KEVIN COLE
ROUGET ROAD LLC
10250 PENLAWN DR.
JEROME, MI 49249

RE: SR25-23 PA233 Review Rouget Road, LLC Solar, T07S/R04E/Sec. 7, 8, 9, 15, 16, 17, 20 ,21, 22, 27, 28, 29, 30, 33, and 34, Palmyra Township, Lenawee County (MPSC)

Dear Mr. Cole:

We have received your request for review of the above-cited project under Public Act 233 of 2023 for Renewable Energy and Energy Storage Facility Siting (PA 233) at the above-noted location. We have reviewed the assessment prepared by SWCA, "Cultural Resources Desktop Review for the Rouget Road, LLC, Lenawee County, Michigan" and appreciate the information provided. To fully consider and address impacts to cultural and historic sites we require additional information, please send the following:

General

In the materials submitted, the project area boundaries in the submission form and in the Desktop Review do not match. Please ensure that we have the final project boundary maps included in all materials submitted to our office. Desktop Review states that the project plan will avoid archaeological sites, however, the project mapping provided does not make this apparent or clear. We cannot assess the impact of the proposed project on historic resources without accurate mapping information. Additionally, we would like to see the locations of staging areas, vehicle traffic, and any other areas that may have ground disturbance mapped.

Archaeological Resources

Due to the presence of previously documented sites within and near the project area, and the high archaeological sensitivity for the River Raisin valley generally, SHPO requests full archaeological survey for the entire project area, including staging areas. In particular, the boundaries of site 20LE28 are poorly delineated. In order to avoid this site, which is known to contain burials, additional survey methodologies may be necessary beyond pedestrian survey or shovel testing***. SHPO recommends consulting with our office and Tribal Nations with historic connections to this region to develop an appropriate methodology***, which may include geophysical prospection or historic human remains detection dog (HRD) survey. SHPO also recommends developing an Unanticipated Discovery Plan (UDP) for the project. A UDP specifies who will be contacted and what measures will be taken in the event of an unanticipated discovery of archaeological materials or human remains during the project implementation. Please see the UDP template attached, for an example of how these documents are organized. SHPO encourages the project proponent to work with consulting party tribes to develop an

appropriate UDP and protocol for handling human remains.

Above-ground Resources

SHPO concurs with the proposed methodology of utilizing the Above Ground Table in lieu of identification forms except that we require identification forms for properties that are identified as eligible. The table does not provide enough information for eligible properties. For eligible properties, photographs of all resources must also be included in an attachment with Architectural Properties Identification Form. When discussing effects to above-ground resources, please be sure to provide discussion of visual impacts as well as visual barriers in place that may play in to effects determinations. Also be sure that the Historic Resource Survey Report contains enough history and contextual information about the area and resources for SHPO to adequately assess eligibility.

Additional information must be submitted online through our Additional Information Portal.

Please note that our review cannot proceed until we are able to consider the information requested above. This letter is not concurrence. If you have any questions, please contact please contact Senior Archaeologist, Sarah Surface-Evans, surfaceevanss1@michigan.gov, (517) 282-7959 or Historian, Katlyn Burns Yancho, at 517-256-3416, burnsyanchok@michigan.gov. **Please reference our project number in all communication with this office regarding this review.** Thank you for your consultation.

Sincerely,

Sarah Surface-Evans, PhD, RPA
Senior Archaeologist

SES:KAK:KBY:SSE

Enclosure(s): UDP Template

Copy: Anna Gilmer, SWCA

Rouget Road Solar Farm

Exhibit A-5: NFPA Compliance

Lenawee County, Michigan

The proposed Project is not an energy storage facility and thus the standards in Exhibit A-5 does not apply.

Rouget Road Solar Farm

Exhibit A-6.1: Environmental Compliance – Soil and Economic Survey Report MPSC Requirements

Lenawee County, Michigan

SEPTEMBER 2026

PREPARED FOR

Rouget Road Solar Farm, LLC
353 N Clark St., 30th Floor
Chicago, IL 60654

PREPARED BY

SWCA Environmental Consultants
200 W 22nd St., Suite 220
Lombard, IL 60148

Exhibits A-6.1 through A-6.4 – Environmental Compliance – Soil and Economic Survey Report

(a) Exhibits A-6.1 through A-6.4 are designed to demonstrate compliance with applicable state and federal environmental laws. Below is a list of the sub exhibits.

1. Exhibit A-6.1: Soil and Economic Survey Report.

Based on a review of the Lenawee County and USDA websites, a soil and economic survey report for the county was available. Based on guidance obtained from MPSC, the USDA Web Soil Survey was reviewed to assess the soil and economic qualities of the county and proposed Project area. Rouget Road Solar Farm, LLC provides with this Application as **Appendix II Exhibit A-6.1** eight Natural Resources Conservation Service Soil Reports for the Project: six reports cumulatively cover the entirety Lenawee County, one report covers the Project area, and one report covers the Project area with an additional 1,000-foot buffer. The attached reports identify prime and statewide important farmland soils within the Project boundary and buffer. See also **Appendix I, Exhibit 2**, Direct Testimony of C .Mcknight, at pp. 11-12.

Additionally, a summary of soil classifications and agricultural productivity indices, which is incorporated here by reference, is included in **Appendix II Exhibit A-9** (Farmland Protection) and demonstrates consistency with PA 233 requirements.

Rouget Road Solar Farm

Exhibit A-6.1: Environmental Compliance – Soil Survey Report

Lenawee County, Michigan

SEPTEMBER 2026

PREPARED FOR

Rouget Road Solar Farm, LLC
353 N Clark St., 30th Floor
Chicago, IL 60654

PREPARED BY

SWCA Environmental Consultants
200 W 22nd St., Suite 220
Lombard, IL 60148

Rouget Road Solar Farm Project
Area Soil Reports

United States Department of Agriculture

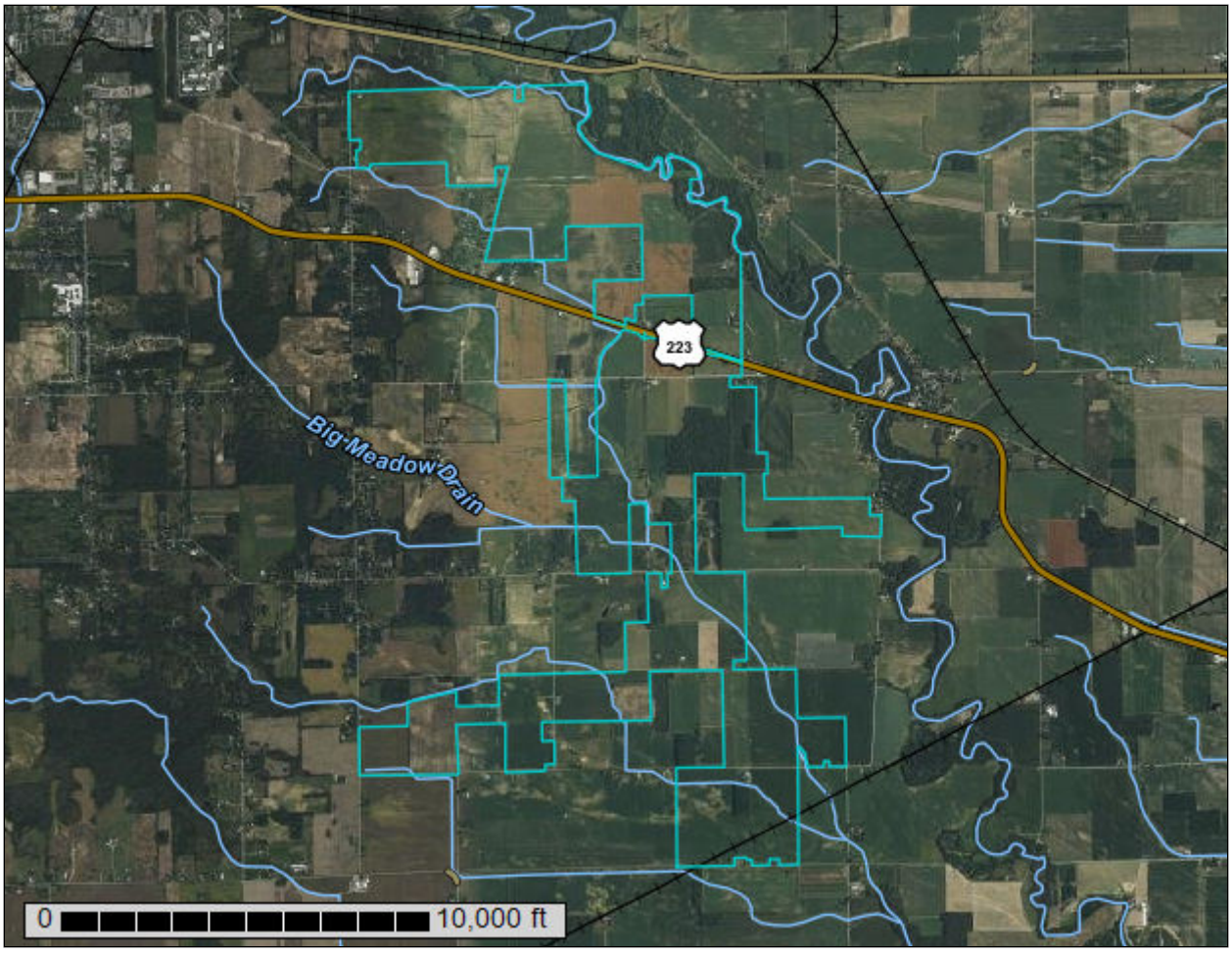
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Lenawee County, Michigan

Leased Area of Rouget Road Solar Project



July 2, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

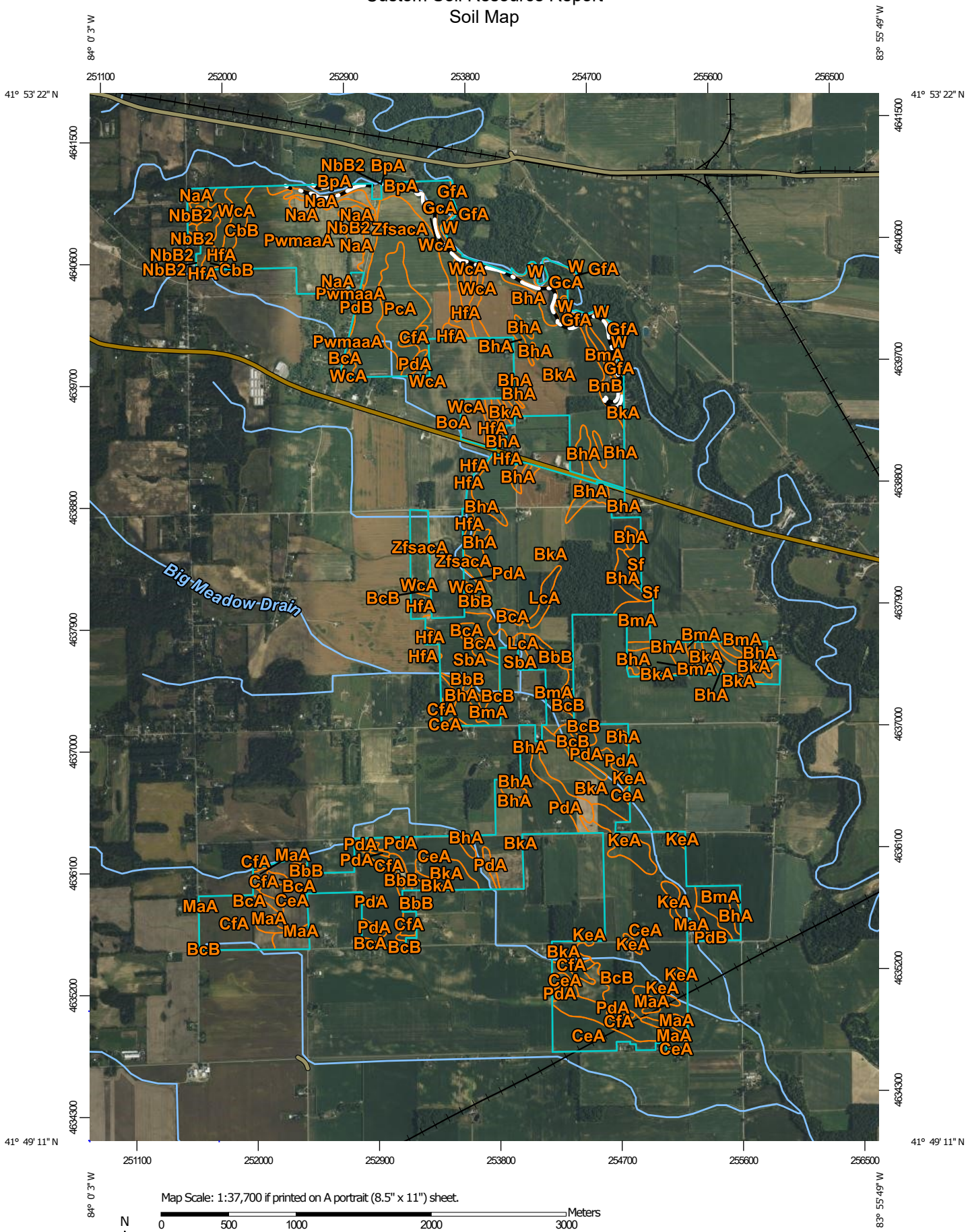
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.


84° 0' 3" W
83° 55' 49" W
41° 53' 22" N
41° 49' 11" N
251100
252000
252900
253800
254700
255600
256500
4641500
4640600
4639700
4638800
4637900
4637000
4636100
4635200
4634300
Big Meadow Drain
NbB2 BpA
BpA
NaA
GfA
GcA
WcA
W
ZfsacA
PwmaaA
CbB
HfA
PdB
PcA
BhA
BmA
BnB
BkA
BoA
CfA
PdA
LcA
SbA
BbB
BcA
BcB
CeA
MaA
KeA
Sf
Map Scale: 1:37,700 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0 500 1000 2000 3000
Feet
0 1500 3000 6000 9000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lenawee County, Michigan
Survey Area Data: Version 20, Aug 27, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 7, 2019—Jul 5, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BbA	Berrien loamy sand, 0 to 3 percent slopes	1.4	0.1%
BbB	Berrien loamy sand, 3 to 7 percent slopes	15.2	0.7%
BcA	Berrien sandy loam, 0 to 3 percent slopes	19.0	0.9%
BcB	Berrien sandy loam, 3 to 7 percent slopes	26.3	1.2%
BhA	Brady sandy loam, 0 to 3 percent slopes	149.6	6.8%
BkA	Brady and Macomb loams, 0 to 3 percent slopes	646.2	29.4%
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	104.1	4.7%
BnB	Bronson sandy loam, 3 to 7 percent slopes	24.1	1.1%
BoA	Brookston loam, 0 to 3 percent slopes	13.9	0.6%
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	6.4	0.3%
CbB	Cadmus sandy loam, 3 to 7 percent slopes	13.5	0.6%
CeA	Colwood very fine sandy loam, 0 to 3 percent slopes	356.9	16.3%
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	100.3	4.6%
CgA	Conover loam, 0 to 3 percent slopes	12.6	0.6%
GcA	Genesee and Eel loams, 0 to 3 percent slopes	37.9	1.7%
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	2.2	0.1%
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	3.0	0.1%
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	38.3	1.7%
KbC	Kendallville sandy loam, 7 to 15 percent slopes	0.2	0.0%
KeA	Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes	38.6	1.8%
KgA	Kokomo, Barry, and Wallkill loams, overwashed, 0 to 3 percent slopes	0.1	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
LcA	Linwood muck, 0 to 3 percent slopes	13.1	0.6%
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	21.3	1.0%
NaA	Nappanee silt loam, 0 to 3 percent slopes	31.2	1.4%
NbB	Nappanee loam, 3 to 7 percent slopes	4.2	0.2%
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	15.5	0.7%
OcC	Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded	5.4	0.2%
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	47.4	2.2%
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	45.5	2.1%
PdB	Plainfield and Berrien loamy sands, 3 to 7 percent slopes	1.9	0.1%
PwmaaA	Pewamo clay loam, dense substratum, 0 to 1 percent slopes	126.8	5.8%
RbA	Rollin muck, 0 to 3 percent slopes	2.6	0.1%
SbA	Sebewa sandy loam, 0 to 3 percent slopes	52.7	2.4%
Sf	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	7.3	0.3%
W	Water	6.8	0.3%
WcA	Wauseon loam, 0 to 3 percent slopes	64.5	2.9%
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	138.6	6.3%
Totals for Area of Interest		**2,194.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some

observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The

pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Lenawee County, Michigan

BbA—Berrien loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b29
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BbB—Berrien loamy sand, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2b
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BcA—Berrien sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2d
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

BcB—Berrien sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2f
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

BhA—Brady sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2r
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Knolls on strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 5 percent
Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BkA—Brady and Macomb loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2s
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 46 percent
Macomb and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Macomb

Setting

Landform: Knolls on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 32 inches: loam
H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 10 percent
Landform: Strand plains, depressions
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BmA—Brady and Macomb sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2t
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 46 percent
Macomb and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Macomb

Setting

Landform: Knolls on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 32 inches: loam
H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BnB—Bronson sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2w
Elevation: 500 to 1,200 feet

Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Bronson and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bronson

Setting

Landform: Knolls on strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 38 inches: sandy loam
H3 - 38 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Brookston

Percent of map unit: 5 percent
Landform: Depressions on moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BoA—Brookston loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2x
Elevation: 500 to 1,020 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Brookston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brookston

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 23 inches: clay loam
H3 - 23 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BpA—Brookston loam, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2y
Elevation: 600 to 900 feet
Mean annual precipitation: 35 to 40 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 150 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Brookston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brookston

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 18 inches: clay loam
H3 - 18 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 11.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

CbB—Cadmus sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b32
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CeA—Colwood very fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b36
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Colwood and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: very fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

CfA—Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b37
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Colwood and similar soils: 51 percent
Wauseon and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Wauseon

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

CgA—Conover loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b38
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Colwood

Percent of map unit: 5 percent
Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

GcA—Genesee and Eel loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b43
Elevation: 340 to 900 feet
Mean annual precipitation: 30 to 46 inches

Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 120 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee and similar soils: 51 percent
Eel and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

Description of Eel

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: loam
H3 - 20 to 60 inches: stratified sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

GfA—Griffin and Genesee loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b46
Elevation: 580 to 1,000 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Genesee and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

GhA—Griffin and Sloan sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b48
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Sloan and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Sloan

Setting

Landform: Depressions on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 22 inches: clay loam
H3 - 22 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

HfA—Hoytville and Wauseon loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4h
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 51 percent
Wauseon and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Wauseon

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None

Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

KbC—Kendallville sandy loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b4n
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

KeA—Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b4r
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Kibbie and similar soils: 51 percent
Colwood and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kibbie

Setting
Landform: Knolls on deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy glaciofluvial deposits

Typical profile
H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent

Available water supply, 0 to 60 inches: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

KgA—Kokomo, Barry, and Wallkill loams, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4v
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 55 degrees F

Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kokomo and similar soils: 40 percent
Barry and similar soils: 30 percent
Wallkill and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kokomo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 31 inches: silty clay loam
H3 - 31 to 60 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Barry

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Wallkill

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over organic material

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: fine sandy loam
Oa - 20 to 60 inches: muck

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 19.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

LcA—Linwood muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4y
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 32 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Linwood and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Linwood

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Woody organic material over loamy till

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 31 inches: muck
H3 - 31 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 17.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

MaA—Macomb fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b50
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Macomb and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Macomb

Setting

Landform: Drainageways on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 32 inches: sandy clay loam
H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

NaA—Nappanee silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b5x
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

NbB—Nappanee loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b60
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

NbB2—Nappanee loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b61
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee, Moderately Eroded

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

OcC—Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded

Map Unit Setting

National map unit symbol: 6b67
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Ottawa and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ottawa

Setting

Landform: Beaches on till-floored lake plains

Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Glaciofluvial deposits and/or sandy glaciolacustrine deposits over loamy till

Typical profile

H1 - 0 to 35 inches: loamy sand
H2 - 35 to 50 inches: fine sand
H3 - 50 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

PcA—Pewamo mucky clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6b
Elevation: 600 to 1,400 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Pewamo and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: mucky silty clay loam
H2 - 7 to 32 inches: clay loam
H3 - 32 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

PdA—Plainfield and Berrien loamy sands, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6c
Elevation: 600 to 1,150 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 51 percent
Berrien and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand

H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

PdB—Plainfield and Berrien loamy sands, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b6d
Elevation: 600 to 1,150 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 51 percent
Berrien and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

PwmaaA—Pewamo clay loam, dense substratum, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2qz3f
Elevation: 670 to 830 feet
Mean annual precipitation: 31 to 36 inches
Mean annual air temperature: 47 to 49 degrees F
Frost-free period: 143 to 182 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo, dense substratum, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo, Dense Substratum

Setting

Landform: Drainageways on nearshore zones (relict), flats on nearshore zones (relict)
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over dense till

Typical profile

Ap - 0 to 11 inches: clay loam
Btg - 11 to 39 inches: clay loam
BCg - 39 to 56 inches: clay loam
2Cd - 56 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 30 to 70 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Metamora, dense substratum

Percent of map unit: 12 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Blount

Percent of map unit: 4 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Gilford, loamy substratum

Percent of map unit: 2 percent
Landform: Drainageways on nearshore zones (relict), depressions on nearshore zones (relict)
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Selfridge, dense substratum

Percent of map unit: 2 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

RbA—Rollin muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6m
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Rollin and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rollin

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over marl

Typical profile

Oa - 0 to 30 inches: muck
Lma - 30 to 60 inches: marly material

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained

Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 90 percent
Available water supply, 0 to 60 inches: Very high (about 15.9 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

SbA—Sebewa sandy loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b6p
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Sebewa and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sebewa

Setting
Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile
H1 - 0 to 8 inches: sandy loam
H2 - 8 to 30 inches: sandy clay loam
H3 - 30 to 60 inches: gravelly sand

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches

Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Sf—Sebewa loam, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2v4bw
Elevation: 570 to 1,070 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 110 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Sebewa and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sebewa

Setting

Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy drift over sandy and gravelly outwash

Typical profile

Ap - 0 to 11 inches: loam
Btg1 - 11 to 21 inches: clay loam
Btg2 - 21 to 33 inches: clay loam
2Cg - 33 to 79 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 23 to 39 inches to strongly contrasting textural stratification
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 inches

Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 45 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 3.0
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways, drainageways on stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Gilford

Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

W—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

WcA—Wauseon loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b75
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Wauseon and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wauseon

Setting
Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile
H1 - 0 to 10 inches: loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

ZfsacA—Ziegenfuss clay loam, 0 to 1 percent slopes

Map Unit Setting
National map unit symbol: 2qz3g
Elevation: 570 to 790 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Ziegenfuss and similar soils: 86 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ziegenfuss

Setting

Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over loamy till

Typical profile

Ap - 0 to 9 inches: clay loam
Bg - 9 to 30 inches: clay loam
BC - 30 to 40 inches: clay loam
C - 40 to 67 inches: clay loam
2Cd - 67 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 60 to 80 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 28 percent
Maximum salinity: Nonsaline (0.1 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 9 percent
Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Houcktown

Percent of map unit: 5 percent

Landform: Wave-worked till plains
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Rouget Road Solar Farm Project Area Soil Reports With a 1,000 Foot Buffer

United States Department of Agriculture

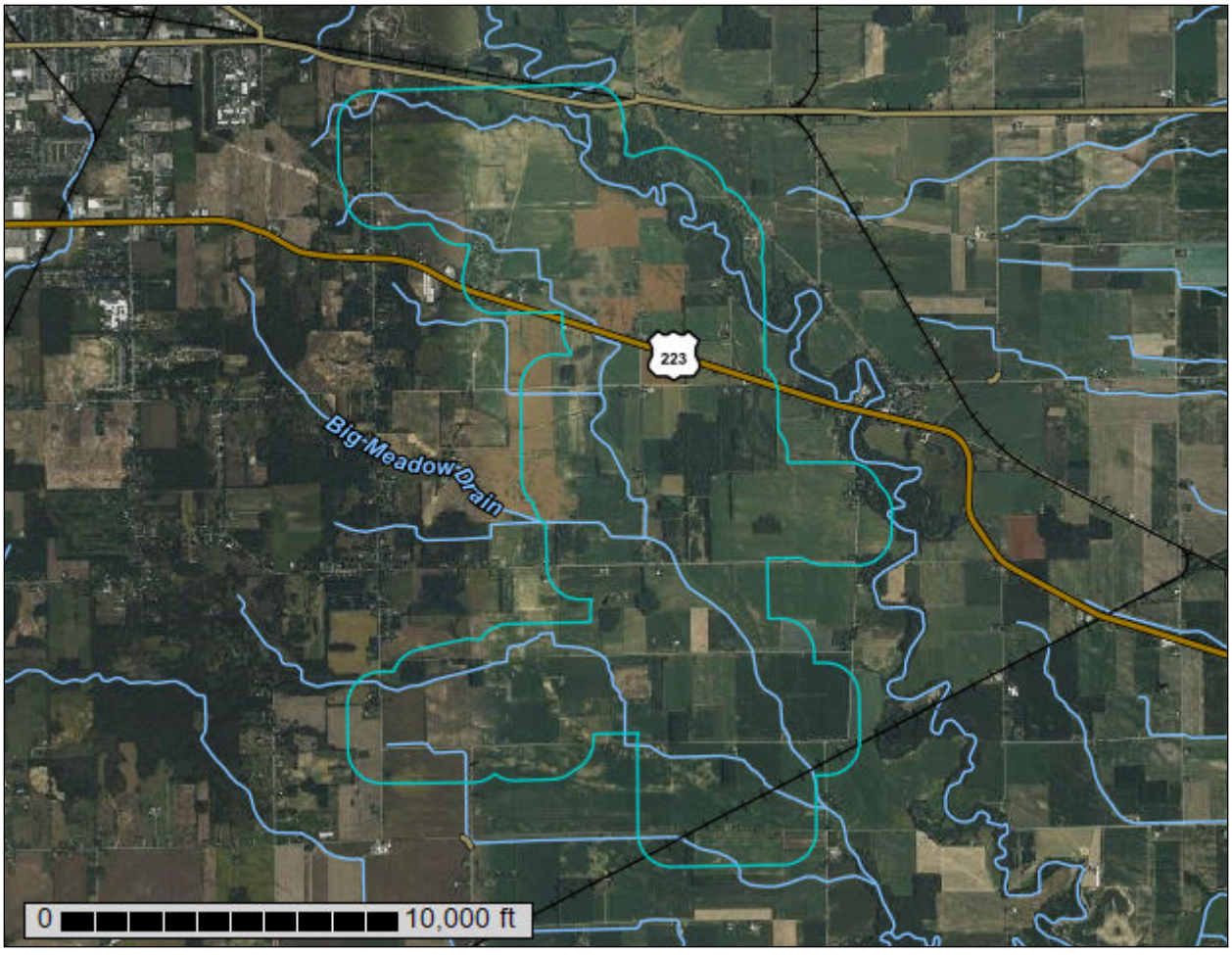
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Lenawee County, Michigan

Leased Area of Rouget Road Solar Project with 1,000 Foot Buffer



July 2, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

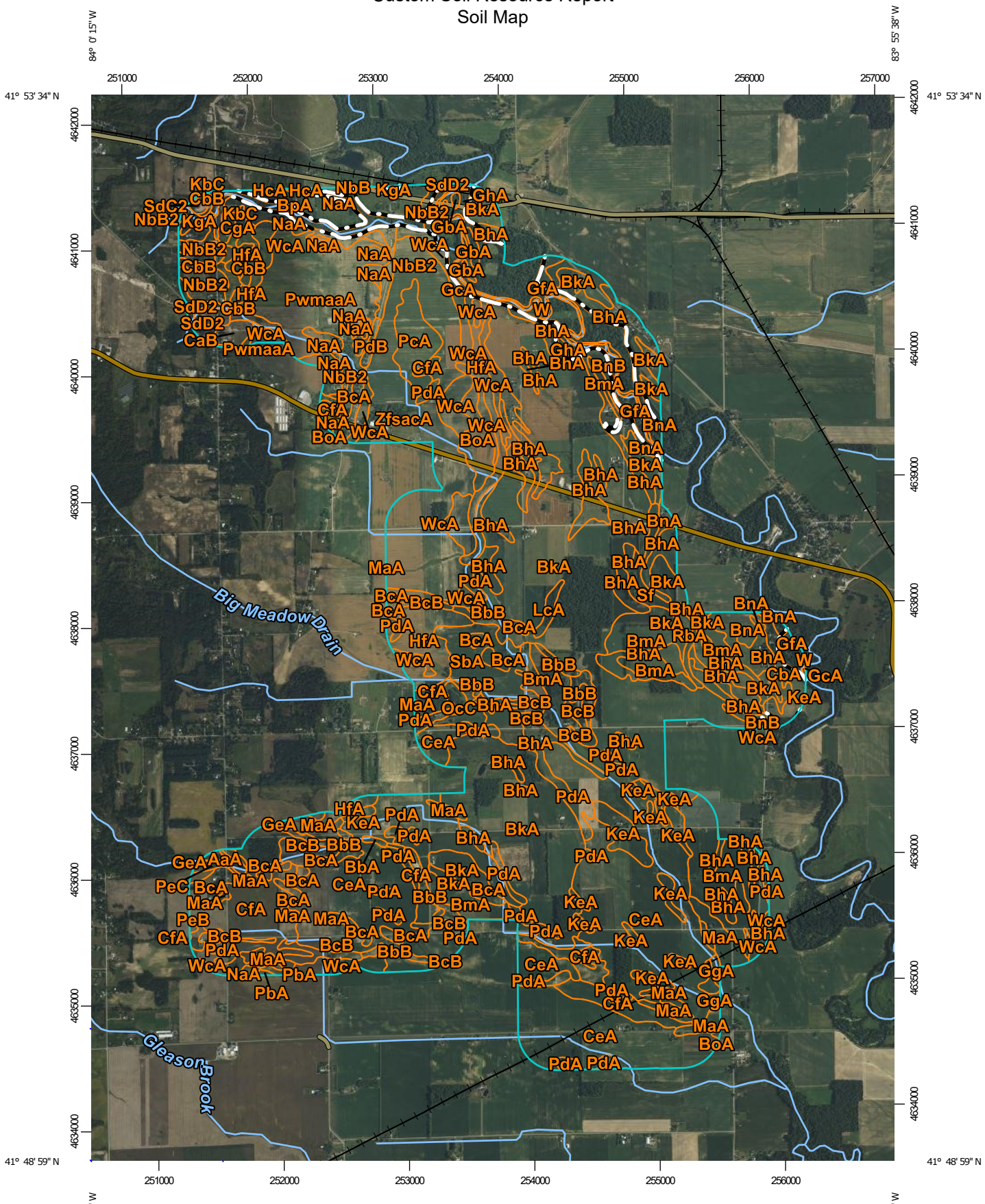
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:41,300 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 500 1000 2000 3000

Feet: 0 2000 4000 8000 12000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lenawee County, Michigan
Survey Area Data: Version 20, Aug 27, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 7, 2019—Jul 5, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AaA	Adrian muck, 0 to 3 percent slopes	5.0	0.1%
BbA	Berrien loamy sand, 0 to 3 percent slopes	2.3	0.0%
BbB	Berrien loamy sand, 3 to 7 percent slopes	36.2	0.7%
BcA	Berrien sandy loam, 0 to 3 percent slopes	66.8	1.4%
BcB	Berrien sandy loam, 3 to 7 percent slopes	87.8	1.8%
BhA	Brady sandy loam, 0 to 3 percent slopes	360.5	7.4%
BkA	Brady and Macomb loams, 0 to 3 percent slopes	1,130.5	23.3%
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	279.0	5.7%
BnA	Bronson sandy loam, 0 to 3 percent slopes	18.9	0.4%
BnB	Bronson sandy loam, 3 to 7 percent slopes	32.4	0.7%
BoA	Brookston loam, 0 to 3 percent slopes	34.2	0.7%
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	34.6	0.7%
CaB	Cadmus loam, 3 to 7 percent slopes	12.8	0.3%
CbA	Cadmus sandy loam, 0 to 3 percent slopes	29.1	0.6%
CbB	Cadmus sandy loam, 3 to 7 percent slopes	21.7	0.4%
CeA	Colwood very fine sandy loam, 0 to 3 percent slopes	786.0	16.2%
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	206.3	4.2%
CgA	Conover loam, 0 to 3 percent slopes	16.5	0.3%
GbA	Genesee sandy loam, 0 to 3 percent slopes	8.6	0.2%
GcA	Genesee and Eel loams, 0 to 3 percent slopes	47.8	1.0%
GeA	Granby sandy loam, 0 to 3 percent slopes	8.2	0.2%
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	112.2	2.3%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
GgA	Griffin and Sloan loams, 0 to 3 percent slopes	5.1	0.1%
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	12.3	0.3%
HcA	Hoytville clay loam and silty clay loam, 0 to 3 percent slopes	0.8	0.0%
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	126.3	2.6%
KbC	Kendallville sandy loam, 7 to 15 percent slopes	11.2	0.2%
KeA	Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes	71.8	1.5%
KgA	Kokomo, Barry, and Wallkill loams, overwashed, 0 to 3 percent slopes	17.6	0.4%
LcA	Linwood muck, 0 to 3 percent slopes	18.9	0.4%
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	64.2	1.3%
NaA	Nappanee silt loam, 0 to 3 percent slopes	158.0	3.3%
NbB	Nappanee loam, 3 to 7 percent slopes	4.4	0.1%
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	56.3	1.2%
OcC	Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded	13.3	0.3%
PbA	Pewamo clay loam, 0 to 2 percent slopes	1.1	0.0%
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	47.4	1.0%
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	82.5	1.7%
PdB	Plainfield and Berrien loamy sands, 3 to 7 percent slopes	9.1	0.2%
PeB	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes	3.7	0.1%
PeC	Plainfield and Ottawa loamy sands, 7 to 15 percent slopes	3.5	0.1%
PwmaaA	Pewamo clay loam, dense substratum, 0 to 1 percent slopes	190.3	3.9%
RbA	Rollin muck, 0 to 3 percent slopes	7.8	0.2%
SbA	Sebewa sandy loam, 0 to 3 percent slopes	67.1	1.4%
SdC2	St. Clair loam, 7 to 15 percent slopes, moderately eroded	3.7	0.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
SdD2	St. Clair loam, 12 to 25 percent slopes, moderately eroded	8.6	0.2%
Sf	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	23.0	0.5%
W	Water	21.6	0.4%
WcA	Wauseon loam, 0 to 3 percent slopes	177.9	3.7%
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	313.4	6.5%
Totals for Area of Interest		**4,858.1**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The

delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Lenawee County, Michigan

AaA—Adrian muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b27
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Adrian and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Adrian

Setting

Landform: Depressions on strand plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over sandy glaciofluvial deposits

Typical profile

Oa - 0 to 32 inches: muck
H2 - 32 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Very high (about 14.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

BbA—Berrien loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b29
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BbB—Berrien loamy sand, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2b
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BcA—Berrien sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2d
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

BcB—Berrien sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2f
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

BhA—Brady sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2r
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Knolls on strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 5 percent
Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BkA—Brady and Macomb loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2s
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 46 percent
Macomb and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Macomb

Setting

Landform: Knolls on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 32 inches: loam
H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 10 percent
Landform: Strand plains, depressions
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BmA—Brady and Macomb sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2t
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 46 percent
Macomb and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Macomb

Setting

Landform: Knolls on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 32 inches: loam
H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BnA—Bronson sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2v
Elevation: 500 to 1,200 feet

Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Bronson and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bronson

Setting

Landform: Knolls on strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 38 inches: sandy loam
H3 - 38 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Brookston

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BnB—Bronson sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2w
Elevation: 500 to 1,200 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Bronson and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bronson

Setting

Landform: Knolls on strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 38 inches: sandy loam
H3 - 38 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Brookston

Percent of map unit: 5 percent
Landform: Depressions on moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BoA—Brookston loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2x
Elevation: 500 to 1,020 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Brookston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brookston

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 23 inches: clay loam
H3 - 23 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent

Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BpA—Brookston loam, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2y
Elevation: 600 to 900 feet
Mean annual precipitation: 35 to 40 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 150 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Brookston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brookston

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 18 inches: clay loam
H3 - 18 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 11.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

CaB—Cadmus loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2z
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CbA—Cadmus sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b31
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

CbB—Cadmus sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b32
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CeA—Colwood very fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b36
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Colwood and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: very fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

CfA—Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b37
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Colwood and similar soils: 51 percent
Wauseon and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Wauseon

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

CgA—Conover loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b38
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Colwood

Percent of map unit: 5 percent
Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

GbA—Genesee sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b41
Elevation: 580 to 900 feet
Mean annual precipitation: 30 to 40 inches

Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F099XY008MI - Moist Floodplain
Hydric soil rating: No

GcA—Genesee and Eel loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b43
Elevation: 340 to 900 feet
Mean annual precipitation: 30 to 46 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 120 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee and similar soils: 51 percent
Eel and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

Description of Eel

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: loam
H3 - 20 to 60 inches: stratified sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained

Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

GeA—Granby sandy loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b45
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition
Granby and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Granby

Setting
Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciofluvial deposits and/or sandy glaciofluvial deposits

Typical profile
H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: fine sand
H3 - 36 to 60 inches: fine sand

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

GfA—Griffin and Genesee loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b46
Elevation: 580 to 1,000 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Genesee and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None

Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

GgA—Griffin and Sloan loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b47
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Sloan and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Sloan

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 22 inches: clay loam
H3 - 22 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

GhA—Griffin and Sloan sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b48
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Sloan and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Sloan

Setting

Landform: Depressions on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 22 inches: clay loam
H3 - 22 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

HcA—Hoytville clay loam and silty clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4d
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silty clay loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

HfA—Hoytville and Wauseon loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4h
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 51 percent
Wauseon and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Wauseon

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

KbC—Kendallville sandy loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b4n
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

KeA—Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4r
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Kibbie and similar soils: 51 percent
Colwood and similar soils: 49 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kibbie

Setting

Landform: Knolls on deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches

Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

KgA—Kokomo, Barry, and Wallkill loams, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4v
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kokomo and similar soils: 40 percent
Barry and similar soils: 30 percent
Wallkill and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kokomo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 31 inches: silty clay loam
H3 - 31 to 60 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches

Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Barry

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Wallkill

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over organic material

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: fine sandy loam

Oa - 20 to 60 inches: muck

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 19.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

LcA—Linwood muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4y
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 32 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Linwood and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Linwood

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Woody organic material over loamy till

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 31 inches: muck
H3 - 31 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 17.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

MaA—Macomb fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b50
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Macomb and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Macomb

Setting

Landform: Drainageways on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 32 inches: sandy clay loam
H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained

Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

NaA—Nappanee silt loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b5x
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile
H1 - 0 to 7 inches: silt loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

NbB—Nappanee loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b60
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: silty clay

H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

NbB2—Nappanee loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b61
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee, Moderately Eroded

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

OcC—Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded

Map Unit Setting

National map unit symbol: 6b67

Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition
Ottawa and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ottawa

Setting
Landform: Beaches on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Glaciofluvial deposits and/or sandy glaciolacustrine deposits over loamy till

Typical profile
H1 - 0 to 35 inches: loamy sand
H2 - 35 to 50 inches: fine sand
H3 - 50 to 60 inches: loam

Properties and qualities
Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

PbA—Pewamo clay loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: 2t6lz
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 205 days

Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on till plains, drainageways on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 11 inches: clay loam
Btg1 - 11 to 34 inches: clay
Btg2 - 34 to 47 inches: clay loam
BCg - 47 to 57 inches: clay loam
Cg - 57 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 8 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Brookston

Percent of map unit: 4 percent
Landform: Drainageways on till plains, depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Palms, undrained

Percent of map unit: 3 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

PcA—Pewamo mucky clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6b
Elevation: 600 to 1,400 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Pewamo and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: mucky silty clay loam
H2 - 7 to 32 inches: clay loam
H3 - 32 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

PdA—Plainfield and Berrien loamy sands, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6c
Elevation: 600 to 1,150 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 51 percent
Berrien and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

PdB—Plainfield and Berrien loamy sands, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b6d
Elevation: 600 to 1,150 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 51 percent
Berrien and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

PeB—Plainfield and Ottawa loamy sands, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b6g
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PeC—Plainfield and Ottawa loamy sands, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b6j
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Beach ridges

Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PwmaaA—Pewamo clay loam, dense substratum, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2qz3f
Elevation: 670 to 830 feet
Mean annual precipitation: 31 to 36 inches
Mean annual air temperature: 47 to 49 degrees F
Frost-free period: 143 to 182 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo, dense substratum, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo, Dense Substratum

Setting

Landform: Drainageways on nearshore zones (relict), flats on nearshore zones (relict)

Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over dense till

Typical profile

Ap - 0 to 11 inches: clay loam
Btg - 11 to 39 inches: clay loam
BCg - 39 to 56 inches: clay loam
2Cd - 56 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 30 to 70 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Metamora, dense substratum

Percent of map unit: 12 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Blount

Percent of map unit: 4 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Gilford, loamy substratum

Percent of map unit: 2 percent
Landform: Drainageways on nearshore zones (relict), depressions on nearshore zones (relict)
Landform position (three-dimensional): Dip
Down-slope shape: Linear

Across-slope shape: Concave
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Selfridge, dense substratum
Percent of map unit: 2 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

RbA—Rollin muck, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b6m
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition
Rollin and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rollin

Setting
Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over marl

Typical profile
Oa - 0 to 30 inches: muck
Lma - 30 to 60 inches: marly material

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 90 percent

Available water supply, 0 to 60 inches: Very high (about 15.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

SbA—Sebewa sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6p
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Sebewa and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sebewa

Setting

Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 30 inches: sandy clay loam
H3 - 30 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: B/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

SdC2—St. Clair loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6x
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

St. clair, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair, Moderately Eroded

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hoytville
Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

SdD2—St. Clair loam, 12 to 25 percent slopes, moderately eroded

Map Unit Setting
National map unit symbol: 6b6y
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
St. clair, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair, Moderately Eroded

Setting
Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Clayey till

Typical profile
H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities
Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

Sf—Sebewa loam, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2v4bw
Elevation: 570 to 1,070 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 110 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Sebewa and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sebewa

Setting

Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread

Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy drift over sandy and gravelly outwash

Typical profile

Ap - 0 to 11 inches: loam
Btg1 - 11 to 21 inches: clay loam
Btg2 - 21 to 33 inches: clay loam
2Cg - 33 to 79 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 23 to 39 inches to strongly contrasting textural stratification
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 45 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 3.0
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways, drainageways on stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Gilford

Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

W—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

WcA—Wauseon loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b75
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Wauseon and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wauseon

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

ZfsacA—Ziegenfuss clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2qz3g
Elevation: 570 to 790 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Ziegenfuss and similar soils: 86 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ziegenfuss

Setting

Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over loamy till

Typical profile

Ap - 0 to 9 inches: clay loam
Bg - 9 to 30 inches: clay loam
BC - 30 to 40 inches: clay loam
C - 40 to 67 inches: clay loam
2Cd - 67 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 60 to 80 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 28 percent
Maximum salinity: Nonsaline (0.1 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 9 percent
Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Houcktown

Percent of map unit: 5 percent
Landform: Wave-worked till plains
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Lenawee County Soil Reports

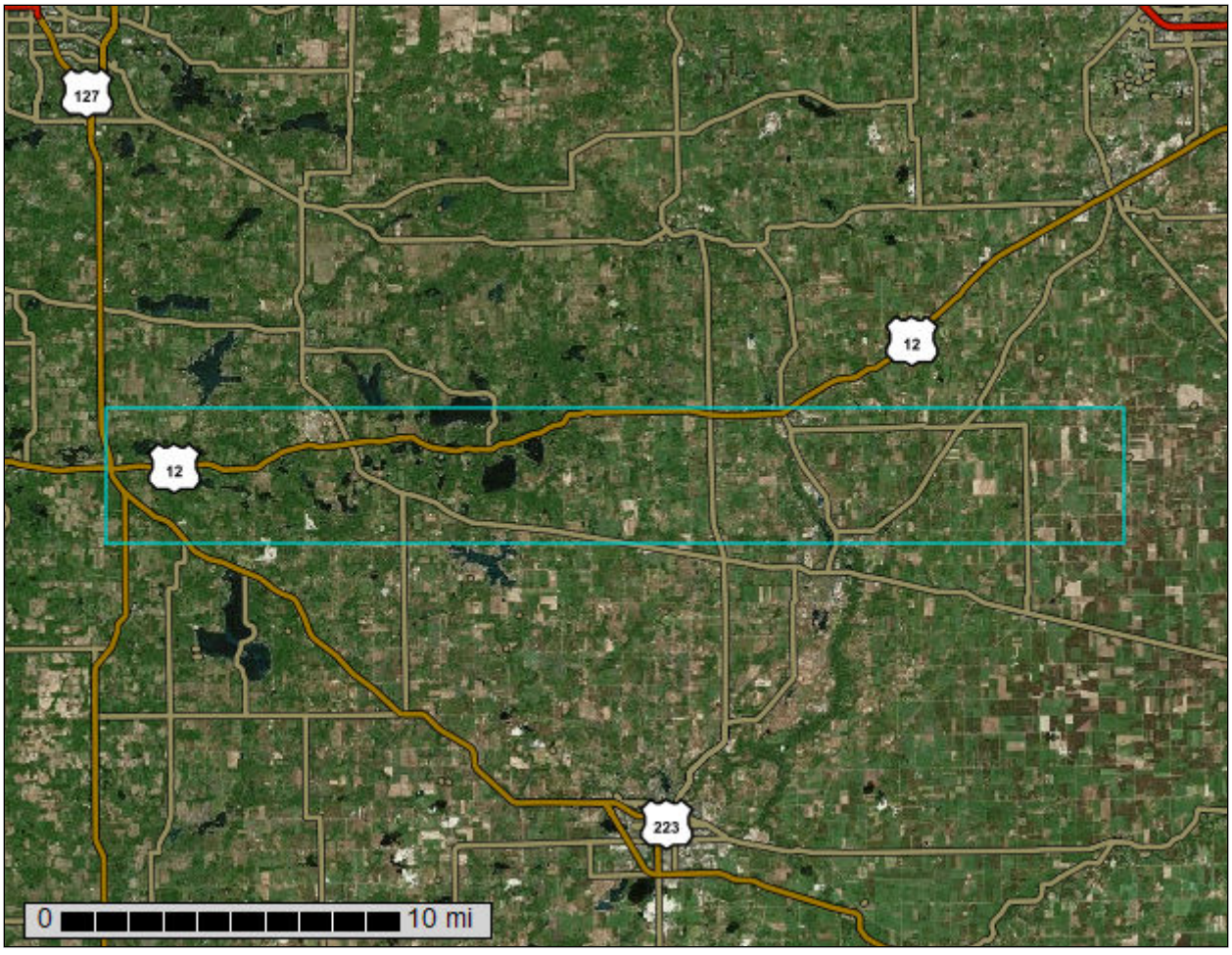
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Jackson County, Michigan, Lenawee County, Michigan, and Washtenaw County, Michigan



June 13, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

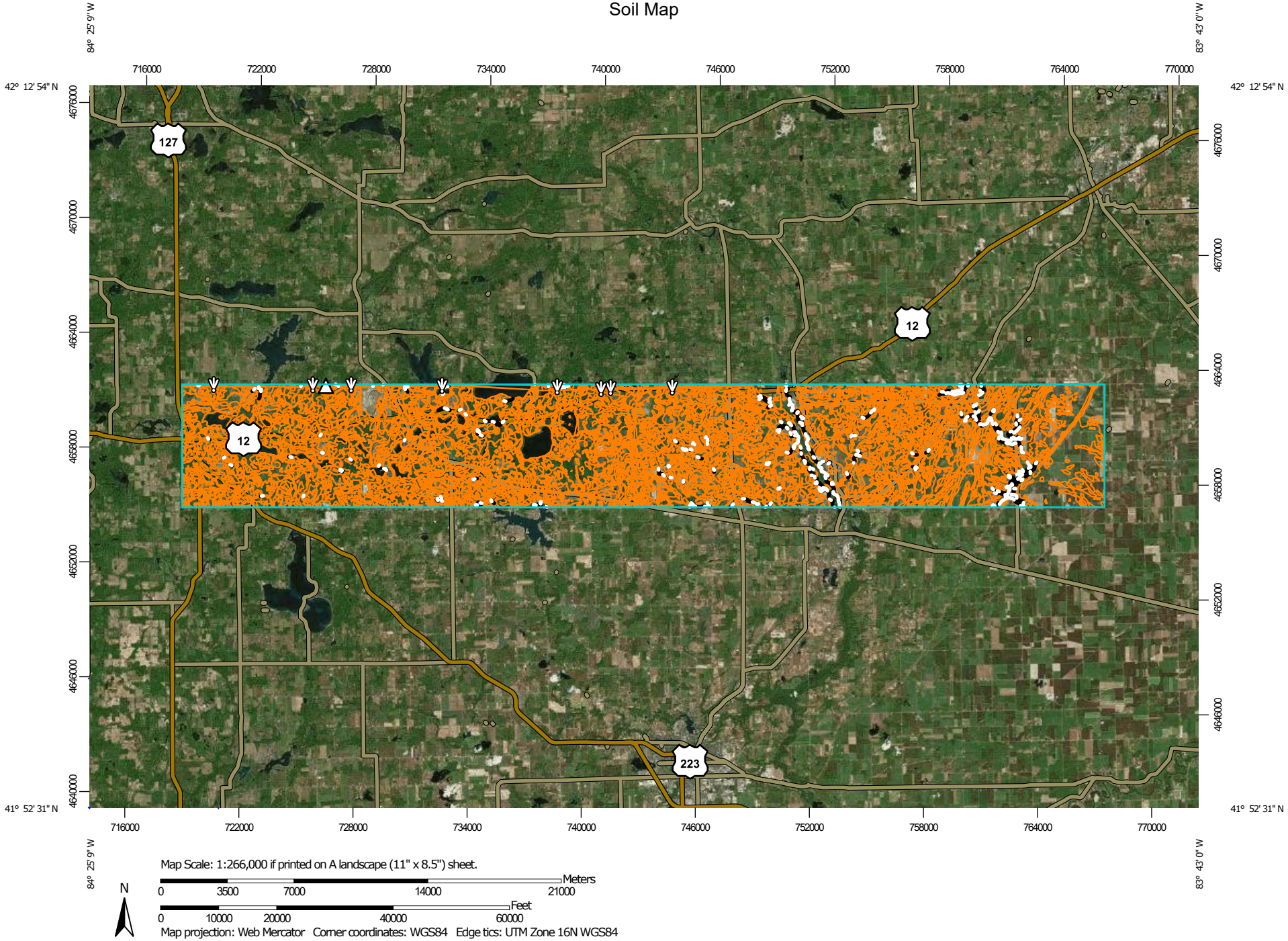
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.


84° 25' 9" W
83° 43' 0" W
42° 12' 54" N
41° 52' 31" N
716000
722000
728000
734000
740000
746000
752000
758000
764000
770000
4676000
4670000
4664000
4658000
4652000
4646000
4640000
127
12
12
223
Map Scale: 1:266,000 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0
3500
7000
14000
21000
Feet
0
10000
20000
40000
60000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:15,800 to 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Jackson County, Michigan
Survey Area Data: Version 21, Aug 27, 2024

Soil Survey Area: Lenawee County, Michigan
Survey Area Data: Version 20, Aug 27, 2024

Soil Survey Area: Washtenaw County, Michigan
Survey Area Data: Version 23, Aug 28, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

MAP LEGEND

MAP INFORMATION

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
11B	Boyer-Oshtemo sandy loams, 1 to 6 percent slopes	44.9	0.1%
11C	Boyer-Oshtemo sandy loams, 6 to 12 percent slopes	39.8	0.1%
11D	Boyer-Oshtemo sandy loams, 12 to 18 percent slopes	11.3	0.0%
11E	Boyer-Leoni complex, 18 to 40 percent slopes	16.4	0.0%
13B	Ormas-Spinks complex, 0 to 6 percent slopes	28.7	0.0%
13C	Ormas-Spinks complex, 6 to 12 percent slopes	3.3	0.0%
14B	Spinks sand, 0 to 6 percent slopes	9.8	0.0%
14C	Spinks sand, 6 to 12 percent slopes	2.9	0.0%
15A	Teasdale fine sandy loam, 0 to 3 percent slopes	3.8	0.0%
16A	Brady sandy loam, 0 to 3 percent slopes	9.0	0.0%
17	Barry loam, 0 to 2 percent slopes	11.6	0.0%
18	Gilford-Colwood complex	4.4	0.0%
22	Cohoctah fine sandy loam	2.0	0.0%
35B	Arkport-Okee loamy fine sands, 2 to 6 percent slopes	0.4	0.0%
42B	Riddles sandy loam, 1 to 6 percent slopes	14.7	0.0%
42C	Riddles sandy loam, 6 to 12 percent slopes	4.8	0.0%
42D	Riddles sandy loam, 12 to 18 percent slopes	6.0	0.0%
43A	Dixboro very fine sandy loam, 0 to 3 percent slopes	7.1	0.0%
45	Martisco muck	0.7	0.0%
47	Histosols and Aquents, ponded	0.1	0.0%
48	Napoleon muck	7.1	0.0%
49E	Hillsdale-Riddles sandy loams, 18 to 30 percent slopes	3.9	0.0%
51	Udorthents and Udipsamments, nearly level	13.4	0.0%
52	Pits, gravel	1.7	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
55B	Eleva sandy loam, 1 to 6 percent slopes	9.0	0.0%
56D	Riddles-Leoni complex, 10 to 20 percent slopes	7.7	0.0%
63	Henrietta muck	6.4	0.0%
64B	Marlette-Owosso complex, 2 to 6 percent slopes	83.4	0.1%
64C	Marlette-Owosso complex, 6 to 12 percent slopes	35.4	0.0%
65A	Capac loam, Lake Michigan lobe, 0 to 4 percent slopes	20.2	0.0%
EdwadA	Edwards muck, 0 to 1 percent slopes	3.3	0.0%
HgtahA	Houghton muck, 0 to 1 percent slopes	17.8	0.0%
PmsacA	Palms muck, 0 to 1 percent slopes	14.4	0.0%
W	Water	162.5	0.2%
Subtotals for Soil Survey Area		**608.3**	**0.8%**
Totals for Area of Interest		**77,052.0**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AaA	Adrian muck, 0 to 3 percent slopes	118.7	0.2%
BaA	Barry sandy loam, overwashed, 0 to 3 percent slopes	385.4	0.5%
BbA	Berrien loamy sand, 0 to 3 percent slopes	17.0	0.0%
BcB	Berrien sandy loam, 3 to 7 percent slopes	86.6	0.1%
BcB2	Berrien sandy loam, 3 to 7 percent slopes, moderately eroded	7.2	0.0%
BcC	Berrien sandy loam, 7 to 15 percent slopes	20.0	0.0%
BgA	Blount loam and Pewamo clay loam, 0 to 3 percent slopes	27.8	0.0%
BhA	Brady sandy loam, 0 to 3 percent slopes	173.6	0.2%
BkA	Brady and Macomb loams, 0 to 3 percent slopes	723.8	0.9%
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	145.3	0.2%
BnA	Bronson sandy loam, 0 to 3 percent slopes	325.3	0.4%
BnB	Bronson sandy loam, 3 to 7 percent slopes	340.5	0.4%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BntaaA	Blount loam, 0 to 2 percent slopes	981.8	1.3%
BntaaB	Blount loam, 2 to 6 percent slopes	1,713.8	2.2%
BntabB	Blount loam, 2 to 6 percent slopes, eroded	17.5	0.0%
BoA	Brookston loam, 0 to 3 percent slopes	392.1	0.5%
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	1,125.1	1.5%
ByB	Boyer loamy sand, 1 to 6 percent slopes	45.1	0.1%
CaB	Cadmus loam, 3 to 7 percent slopes	886.0	1.1%
CaB2	Cadmus loam, 3 to 7 percent slopes, moderately eroded	15.7	0.0%
CarabA	Carlisle muck, 0 to 2 percent slopes	977.2	1.3%
CaracA	Carlisle muck, disintegration moraine, 0 to 2 percent slopes	379.4	0.5%
CbA	Cadmus sandy loam, 0 to 3 percent slopes	197.6	0.3%
CbB	Cadmus sandy loam, 3 to 7 percent slopes	335.3	0.4%
CcA	Cadmus and Blount loams, 0 to 3 percent slopes	433.4	0.6%
CeA	Colwood very fine sandy loam, 0 to 3 percent slopes	154.4	0.2%
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	236.0	0.3%
CgA	Conover loam, 0 to 3 percent slopes	787.4	1.0%
CgB	Conover loam, 3 to 7 percent slopes	642.4	0.8%
EaA	Edwards muck, 0 to 3 percent slopes	827.9	1.1%
FaA	Fox cobbly gravelly loam, 0 to 3 percent slopes	5.2	0.0%
FbA	Fox loam, 0 to 3 percent slopes	726.3	0.9%
FbB	Fox loam, 3 to 7 percent slopes	630.6	0.8%
FbC	Fox loam, 7 to 15 percent slopes	14.2	0.0%
FbC2	Fox loam, 7 to 15 percent slopes, moderately eroded	139.2	0.2%
FcA	Fox sandy loam, till plain, 0 to 2 percent slopes	874.3	1.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
FcB	Fox sandy loam, till plain, 2 to 6 percent slopes	3,049.4	4.0%
FcB2	Fox sandy loam, 3 to 7 percent slopes, moderately eroded	25.0	0.0%
FcC	Fox sandy loam, Huron Lobe, 6 to 12 percent slopes	2,874.9	3.7%
FcC2	Fox sandy loam, Huron Lobe, 6 to 12 percent slopes, eroded	742.2	1.0%
FcD	Fox sandy loam, Huron Lobe, 12 to 25 percent slopes	2,386.8	3.1%
FcD2	Fox sandy loam, 12 to 25 percent slopes, moderately eroded	1,661.8	2.2%
FcE	Fox sandy loam, 25+ percent slopes	165.4	0.2%
FdC3	Fox soils, 7 to 15 percent slopes, severely eroded	39.5	0.1%
FdD3	Fox soils, 12 to 25 percent slopes, severely eroded	45.2	0.1%
FdE2	Fox soils, 25+ percent slopes, moderately or severely eroded	44.4	0.1%
GbA	Genesee sandy loam, 0 to 3 percent slopes	2.6	0.0%
GcA	Genesee and Eel loams, 0 to 3 percent slopes	9.0	0.0%
GeA	Granby sandy loam, 0 to 3 percent slopes	1.4	0.0%
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	364.6	0.5%
GgA	Griffin and Sloan loams, 0 to 3 percent slopes	38.7	0.1%
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	1,045.7	1.4%
Gp	Gravel pits	161.8	0.2%
HcA	Hoytville clay loam and silty clay loam, 0 to 3 percent slopes	396.1	0.5%
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	806.0	1.0%
HgtahA	Houghton muck, 0 to 1 percent slopes	3,152.0	4.1%
HgtaiA	Houghton muck, Erie-Huron lake plain, 0 to 1 percent slopes	4.8	0.0%
HgtanA	Houghton muck, disintegration moraine, 0 to 2 percent slopes	198.3	0.3%
IaA	Ionia loam, 0 to 3 percent slopes	358.0	0.5%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
IaB	Ionia loam, 3 to 7 percent slopes	232.4	0.3%
KaC	Kendallville loam, 7 to 15 percent slopes	63.2	0.1%
KaC2	Kendallville loam, 7 to 15 percent slopes, moderately eroded	148.4	0.2%
KbC	Kendallville sandy loam, 7 to 15 percent slopes	93.1	0.1%
KcC2	Kendallville soils, 7 to 15 percent slopes, moderately or severely eroded	1.3	0.0%
KdA	Kerston muck and loams, 0 to 3 percent slopes	285.1	0.4%
KfA	Kokomo and Barry loams, 0 to 3 percent slopes	940.7	1.2%
KgA	Kokomo, Barry, and Wallkill loams, overwashed, 0 to 3 percent slopes	1,089.3	1.4%
LaA	Lake borders	251.9	0.3%
LcA	Linwood muck, 0 to 3 percent slopes	57.7	0.1%
Le	Lenawee silty clay loam, 0 to 1 percent slopes	64.8	0.1%
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	281.8	0.4%
MbA	Macomb sandy clay loam and Hoytville clay loam, 0 to 3 percent slopes	36.7	0.0%
McA	Maumee loamy sand, 0 to 3 percent slopes	69.0	0.1%
MdA	Miami loam, 0 to 3 percent slopes	22.3	0.0%
MeD	Miami loam and Boyer sandy loam, 12 to 25 percent slopes	1,073.9	1.4%
MeD2	Miami loam and Boyer sandy loam, 12 to 25 percent slopes, moderately eroded	1,806.4	2.3%
MeE	Miami loam and Boyer sandy loam, 25+ percent slopes	76.2	0.1%
MfD3	Miami soils, 15 to 25 percent slopes, severely eroded	29.2	0.0%
MgD3	Miami and Boyer soils, 12 to 25 percent slopes, severely eroded	71.2	0.1%
MgE2	Miami and Boyer soils, 25+ percent slopes, moderately eroded	86.5	0.1%
MhA	Morley loam, 0 to 3 percent slopes	5.1	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MhB	Glynwood loam, 2 to 6 percent slopes	792.7	1.0%
MhB2	Glynwood loam, 2 to 6 percent slopes, eroded	4,320.7	5.6%
MhC	Morley loam, 6 to 12 percent slopes	104.2	0.1%
MhC2	Morley loam, 6 to 12 percent slopes, eroded	3,463.3	4.5%
MhD	Morley loam, 12 to 25 percent slopes	61.6	0.1%
MhD2	Morley loam, 12 to 25 percent slopes, moderately eroded	1,075.9	1.4%
MkC3	Morley soils, 7 to 15 percent slopes, severely eroded	16.9	0.0%
MkD3	Morley clay loam, 12 to 18 percent slopes, severely eroded	5.4	0.0%
NaA	Nappanee silt loam, 0 to 3 percent slopes	2,106.0	2.7%
NaB	Nappanee silt loam, 3 to 7 percent slopes	7.9	0.0%
NaB2	Nappanee silt loam, 3 to 7 percent slopes, moderately eroded	9.7	0.0%
NbB	Nappanee loam, 3 to 7 percent slopes	81.1	0.1%
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	871.9	1.1%
OaA	Ogden muck, 0 to 3 percent slopes	30.5	0.0%
ObA	Oshtemo loamy sand, 0 to 3 percent slopes	88.1	0.1%
ObB	Oshtemo loamy sand, 3 to 7 percent slopes	78.6	0.1%
ObB2	Oshtemo loamy sand, 3 to 7 percent slopes, moderately eroded	12.9	0.0%
ObC	Oshtemo loamy sand, 7 to 15 percent slopes	35.6	0.0%
PaA	Palms muck, 0 to 3 percent slopes	65.8	0.1%
PbA	Pewamo clay loam, 0 to 2 percent slopes	2,815.0	3.7%
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	51.9	0.1%
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	39.7	0.1%
PeA	Plainfield and Ottawa loamy sands, 0 to 3 percent slopes	2.0	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PeC	Plainfield and Ottawa loamy sands, 7 to 15 percent slopes	24.7	0.0%
PeC2	Plainfield and Ottawa loamy sands, 7 to 15 percent slopes, moderately eroded	4.3	0.0%
PwmaaA	Pewamo clay loam, dense substratum, 0 to 1 percent slopes	2,089.8	2.7%
RaA	Rifle peat, 0 to 3 percent slopes	136.4	0.2%
RbA	Rollin muck, 0 to 3 percent slopes	397.8	0.5%
SbA	Sebewa sandy loam, 0 to 3 percent slopes	148.8	0.2%
SdC2	St. Clair loam, 7 to 15 percent slopes, moderately eroded	213.5	0.3%
SdD2	St. Clair loam, 12 to 25 percent slopes, moderately eroded	53.8	0.1%
Sf	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	154.3	0.2%
Sg	Sewage lagoons	22.0	0.0%
TaA	Tawas muck, 0 to 3 percent slopes	27.4	0.0%
Ud	Udorthents, nearly level and undulating	381.3	0.5%
W	Water	3,290.5	4.3%
WaA	Wallkill loam, overwashed, 0 to 3 percent slopes	161.8	0.2%
WawaaC	Wawasee clay loam, 6 to 12 percent slopes, severely eroded	12.1	0.0%
WawabB	Wawasee loam, 2 to 6 percent slopes	2,335.1	3.0%
WawabC	Wawasee loam, 6 to 12 percent slopes	3,501.7	4.5%
WawacB	Wawasee loam, 2 to 6 percent slopes, eroded	150.5	0.2%
WawacC	Wawasee loam, 6 to 12 percent slopes, eroded	2,549.2	3.3%
WawadD	Wawasee loam, 12 to 25 percent slopes, eroded	133.7	0.2%
WbA	Warners muck and marl, 0 to 3 percent slopes	150.4	0.2%
WcA	Wauseon loam, 0 to 3 percent slopes	1,061.1	1.4%
WdA	Willette muck, 0 to 3 percent slopes	311.5	0.4%
YpA	Ypsi sandy loam, 0 to 4 percent slopes	0.0	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	2,864.8	3.7%
Subtotals for Soil Survey Area		**75,582.8**	**98.1%**
Totals for Area of Interest		**77,052.0**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ad	Adrian muck	1.7	0.0%
BnC	Boyer loamy sand, 6 to 12 percent slopes	7.3	0.0%
BnE	Boyer loamy sand, 18 to 25 percent slopes	8.1	0.0%
BnF	Boyer loamy sand, 25 to 50 percent slopes	4.3	0.0%
BntaaB	Blount loam, 2 to 6 percent slopes	14.0	0.0%
BoE	Boyer-Kidder complex, 15 to 35 percent slopes	9.8	0.0%
Br	Brookston loam	11.7	0.0%
CoB	Conover loam, 0 to 4 percent slopes	17.9	0.0%
CpA	Conover-Brookston loams, 0 to 2 percent slopes	2.2	0.0%
FoB	Fox sandy loam, till plain, 2 to 6 percent slopes	35.0	0.0%
FoC	Fox sandy loam, Huron Lobe, 6 to 12 percent slopes	12.2	0.0%
FoD	Fox sandy loam, 12 to 18 percent slopes	6.5	0.0%
FoE	Fox sandy loam, 18 to 25 percent slopes	2.6	0.0%
HgtahA	Houghton muck, 0 to 1 percent slopes	26.7	0.0%
HgtanA	Houghton muck, disintegration moraine, 0 to 2 percent slopes	4.7	0.0%
KeC	Kendallville loam, 6 to 12 percent slopes	0.2	0.0%
KnA	Kibbie fine sandy loam, 0 to 4 percent slopes	0.5	0.0%
KrB	Kidder sandy loam, 2 to 6 percent slopes	9.2	0.0%
KrC	Kidder sandy loam, 6 to 12 percent slopes	11.4	0.0%
KrD	Kidder sandy loam, 12 to 18 percent slopes	4.0	0.0%
MdA	Matherton sandy loam, 0 to 4 percent slopes	4.2	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MfA	Metamora sandy loam, 0 to 4 percent slopes	4.4	0.0%
MmF	Miami loam, 25 to 35 percent slopes	8.5	0.0%
MoB	Glynwood loam, 2 to 6 percent slopes	20.7	0.0%
MoC	Morley loam, 6 to 12 percent slopes	43.9	0.1%
MoD	Morley loam, 12 to 18 percent slopes	1.3	0.0%
OsB	Oshtemo loamy sand, 0 to 6 percent slopes	13.2	0.0%
OwB	Owosso-Miami complex, 2 to 6 percent slopes	14.5	0.0%
Pa	Palms muck	6.6	0.0%
Pe	Pewamo clay loam, 0 to 2 percent slopes	18.3	0.0%
Sb	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	1.5	0.0%
So	Sloan silt loam, 0 to 1 percent slopes, frequently flooded	1.0	0.0%
SpB	Spinks loamy sand, 0 to 6 percent slopes	4.8	0.0%
SpC	Spinks loamy sand, 6 to 12 percent slopes	2.6	0.0%
SpD	Spinks loamy sand, 12 to 18 percent slopes	0.0	0.0%
SpE	Spinks loamy sand, 18 to 25 percent slopes	5.8	0.0%
W	Water	43.3	0.1%
WawabB	Wawasee loam, 2 to 6 percent slopes	23.5	0.0%
WawabC	Wawasee loam, 6 to 12 percent slopes	46.9	0.1%
WawabD	Wawasee loam, 12 to 18 percent slopes	12.6	0.0%
WawabE	Wawasee loam, 18 to 25 percent slopes	66.8	0.1%
Subtotals for Soil Survey Area		**534.6**	**0.7%**
Totals for Area of Interest		**77,052.0**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas

shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Jackson County, Michigan

11B—Boyer-Oshtemo sandy loams, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 6bdj
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Boyer and similar soils: 51 percent
Oshtemo and similar soils: 39 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boyer

Setting

Landform: Flats on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 31 inches: sandy loam
H3 - 31 to 34 inches: gravelly sandy clay loam
H4 - 34 to 60 inches: very gravelly sand

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Description of Oshtemo

Setting

Landform: Flats on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits

Typical profile

H1 - 0 to 17 inches: sandy loam
H2 - 17 to 28 inches: gravelly sandy loam
H3 - 28 to 60 inches: Error

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Spinks

Percent of map unit: 4 percent
Landform: Flats on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Brady

Percent of map unit: 3 percent
Landform: Drainageways on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Leoni

Percent of map unit: 3 percent
Landform: Flats on outwash plains

Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

11C—Boyer-Oshtemo sandy loams, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 6bdk
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Boyer and similar soils: 49 percent
Oshtemo and similar soils: 36 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boyer

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 31 inches: sandy loam
H3 - 31 to 34 inches: gravelly sandy clay loam
H4 - 34 to 60 inches: very gravelly sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Description of Oshtemo

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits

Typical profile

H1 - 0 to 17 inches: sandy loam
H2 - 17 to 28 inches: gravelly sandy loam
H3 - 28 to 60 inches: Error

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Brady

Percent of map unit: 5 percent
Landform: Swales on outwash plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Convex

Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Spinks

Percent of map unit: 5 percent
Landform: Knolls on outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Leoni

Percent of map unit: 5 percent
Landform: Knolls on outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

11D—Boyer-Oshtemo sandy loams, 12 to 18 percent slopes

Map Unit Setting

National map unit symbol: 6bdl
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Boyer and similar soils: 49 percent
Oshtemo and similar soils: 36 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boyer

Setting

Landform: Hills on ice-contact slopes, ridges on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 31 inches: sandy loam
H3 - 31 to 34 inches: gravelly sandy clay loam
H4 - 34 to 60 inches: very gravelly sand

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Description of Oshtemo

Setting

Landform: Hills on ice-contact slopes, ridges on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Sandy and/or loamy glaciofluvial deposits

Typical profile

H1 - 0 to 17 inches: sandy loam
H2 - 17 to 28 inches: gravelly sandy loam
H3 - 28 to 60 inches: Error

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Leoni

Percent of map unit: 5 percent
Landform: Hills on ice-contact slopes, ridges on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Spinks

Percent of map unit: 5 percent
Landform: Hills on ice-contact slopes, ridges on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA021MI - Sandy Slopes
Hydric soil rating: No

Brady

Percent of map unit: 5 percent
Landform: Hills on ice-contact slopes, ridges on ice-contact slopes
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

11E—Boyer-Leoni complex, 18 to 40 percent slopes

Map Unit Setting

National map unit symbol: 6bdm
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Boyer and similar soils: 48 percent
Leoni and similar soils: 37 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boyer

Setting

Landform: Hills on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 31 inches: sandy loam
H3 - 31 to 34 inches: gravelly sandy clay loam
H4 - 34 to 60 inches: very gravelly sand

Properties and qualities

Slope: 18 to 40 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Description of Leoni

Setting

Landform: Hills on ice-contact slopes, valley trains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Gravelly loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 13 inches: gravelly sandy loam
H2 - 13 to 29 inches: gravelly sandy clay loam
H3 - 29 to 42 inches: gravelly sandy loam
H4 - 42 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 18 to 40 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Hillsdale

Percent of map unit: 10 percent
Landform: Hills on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Spinks

Percent of map unit: 5 percent
Landform: Hills on outwash terraces, ridges on outwash terraces
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA021MI - Sandy Slopes
Hydric soil rating: No

13B—Ormas-Spinks complex, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 6bdn
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Ormas and similar soils: 45 percent
Oshtemo and similar soils: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ormas

Setting

Landform: Flats on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glacial drift loamy glacial drift

Typical profile

H1 - 0 to 21 inches: loamy sand
H2 - 21 to 26 inches: sandy loam
H3 - 26 to 45 inches: sandy clay loam
H4 - 45 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Description of Oshtemo

Setting

Landform: Flats on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits

Typical profile

H1 - 0 to 17 inches: sandy loam
H2 - 17 to 28 inches: gravelly sandy loam
H3 - 28 to 60 inches: Error

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Brady

Percent of map unit: 8 percent
Landform: Drainageways on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Spinks

Percent of map unit: 6 percent
Landform: Flats on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Boyer

Percent of map unit: 6 percent
Landform: Flats on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

13C—Ormas-Spinks complex, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 6bdp
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Ormas and similar soils: 47 percent
Spinks and similar soils: 35 percent
Minor components: 18 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ormas

Setting

Landform: Knolls on outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glacial drift loamy glacial drift

Typical profile

H1 - 0 to 21 inches: loamy sand
H2 - 21 to 26 inches: sandy loam
H3 - 26 to 45 inches: sandy clay loam
H4 - 45 to 60 inches: gravelly sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Description of Spinks

Setting

Landform: Knolls on outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 18 inches: sand
H2 - 18 to 29 inches: sand
H3 - 29 to 60 inches: stratified sand to fine sand to loamy fine sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Minor Components

Brady
Percent of map unit: 8 percent
Landform: Drainageways on outwash plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Boyer
Percent of map unit: 5 percent
Landform: Knolls on outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Oshtemo
Percent of map unit: 5 percent
Landform: Knolls on outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

14B—Spinks sand, 0 to 6 percent slopes

Map Unit Setting
National map unit symbol: 2x2sw
Elevation: 820 to 1,080 feet
Mean annual precipitation: 28 to 41 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 140 to 220 days

Farmland classification: Farmland of local importance

Map Unit Composition

Spinks and similar soils: 88 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Spinks

Setting

Landform: Moraines, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Sandy glaciofluvial deposits

Typical profile

Ap - 0 to 9 inches: sand
Bw - 9 to 23 inches: sand
E and Bt - 23 to 57 inches: loamy sand
C - 57 to 80 inches: sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (1.42 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Maximum salinity: Nonsaline (0.0 to 0.4 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F098XA013MI - Piney Dry Sandy Drift Plains
Hydric soil rating: No

Minor Components

Oshtemo

Percent of map unit: 5 percent
Landform: Moraines, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F098XA008MI - Piney Dry Loamy Till Knolls

Hydric soil rating: No

Thetford

Percent of map unit: 3 percent
Landform: Moraines, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F098XA019MI - Moist Sandy Drift Plains
Hydric soil rating: No

Metea

Percent of map unit: 2 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Ecological site: F098XA013MI - Piney Dry Sandy Drift Plains
Hydric soil rating: No

Brady

Percent of map unit: 2 percent
Landform: Moraines, outwash plains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

14C—Spinks sand, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 6bds
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Spinks and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Spinks

Setting

Landform: Knolls on ice-contact slopes

Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 18 inches: sand
H2 - 18 to 29 inches: sand
H3 - 29 to 60 inches: stratified sand to fine sand to loamy fine sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Minor Components

Brady

Percent of map unit: 5 percent
Landform: Drainageways on ice-contact slopes
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Oshtemo

Percent of map unit: 5 percent
Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Ormas

Percent of map unit: 5 percent
Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

15A—Teasdale fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6bdv
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Teasdale and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Teasdale

Setting

Landform: Drainageways on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 13 inches: fine sandy loam
H2 - 13 to 55 inches: fine sandy loam
H3 - 55 to 65 inches: fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Barry

Percent of map unit: 7 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Hillsdale

Percent of map unit: 4 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Riddles

Percent of map unit: 4 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

16A—Brady sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6bdw
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 83 percent
Minor components: 17 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Drainageways on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy glaciofluvial deposits

Typical profile

H1 - 0 to 13 inches: sandy loam
H2 - 13 to 30 inches: sandy loam
H3 - 30 to 54 inches: loamy sand
H4 - 54 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Gilford

Percent of map unit: 7 percent
Landform: Depressions on outwash plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Oshtemo

Percent of map unit: 4 percent
Landform: Knolls on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear

Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Boyer

Percent of map unit: 3 percent
Landform: Knolls on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Spinks

Percent of map unit: 3 percent
Landform: Knolls on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

17—Barry loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2w5mz
Elevation: 820 to 1,090 feet
Mean annual precipitation: 30 to 41 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Barry and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Barry

Setting

Landform: Depressions on moraines, flats on till plains, drainageways on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Concave
Across-slope shape: Concave, linear
Parent material: Calcareous coarse-loamy till

Typical profile

Ap - 0 to 11 inches: loam
Btg - 11 to 30 inches: loam
BCg - 30 to 37 inches: sandy loam

Cg - 37 to 80 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 3.0
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Minor Components

Locke

Percent of map unit: 5 percent
Landform: Flats on till plains, depressions on moraines, drainageways on moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope, rise
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brady

Percent of map unit: 2 percent
Landform: Flats on till plains, depressions on moraines, drainageways on moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope, rise
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Palms

Percent of map unit: 2 percent
Landform: Depressions on moraines, swamps on moraines, drainageways on till plains, drainageways on moraines, drainageways on outwash plains, depressions on outwash plains, depressions on till plains, swamps on outwash plains, swamps on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear

Across-slope shape: Concave, linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Gilford, gravelly subsoil

Percent of map unit: 1 percent
Landform: Depressions on moraines, drainageways on moraines, flats on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Concave
Across-slope shape: Concave, linear
Ecological site: F098XA020MI - Wet Sandy Drift Depressions
Hydric soil rating: Yes

18—Gilford-Colwood complex

Map Unit Setting

National map unit symbol: 6bdy
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Gilford and similar soils: 48 percent
Colwood and similar soils: 38 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gilford

Setting

Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and/or loamy glaciofluvial deposits

Typical profile

H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 50 inches: fine sandy loam
H3 - 50 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Description of Colwood

Setting

Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified sandy and silty glaciofluvial deposits

Typical profile

H1 - 0 to 16 inches: silt loam
H2 - 16 to 33 inches: loam
H3 - 33 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Minor Components

Henrietta

Percent of map unit: 7 percent
Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Dixboro

Percent of map unit: 4 percent
Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Kibbie

Percent of map unit: 3 percent
Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

22—Cohoctah fine sandy loam

Map Unit Setting

National map unit symbol: 6bf0
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Cohoctah and similar soils: 83 percent
Minor components: 17 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cohoctah

Setting

Landform: Depressions on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 40 inches: fine sandy loam
H3 - 40 to 60 inches: stratified loamy fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

Minor Components

Palms

Percent of map unit: 10 percent
Landform: Backswamps on flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Gilford

Percent of map unit: 4 percent
Landform: Meander scars on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Colwood

Percent of map unit: 3 percent
Landform: Sloughs on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

35B—Arkport-Okee loamy fine sands, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 6bf3
Elevation: 660 to 980 feet

Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Arkport and similar soils: 41 percent
Okee and similar soils: 38 percent
Minor components: 21 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arkport

Setting

Landform: Flats on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: loamy fine sand
H2 - 8 to 21 inches: loamy fine sand
H3 - 21 to 62 inches: loamy fine sand
H4 - 62 to 66 inches: fine sand

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Description of Okee

Setting

Landform: Flats on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 8 inches: loamy fine sand

H2 - 8 to 24 inches: loamy fine sand
H3 - 24 to 40 inches: sandy loam
H4 - 40 to 58 inches: sandy loam
H5 - 58 to 66 inches: sandy loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Minor Components

Oshtemo

Percent of map unit: 7 percent
Landform: Flats on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Boyer

Percent of map unit: 7 percent
Landform: Flats on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Dixboro

Percent of map unit: 7 percent
Landform: Drainageways on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

42B—Riddles sandy loam, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 31gt6
Elevation: 920 to 1,160 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Riddles and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Riddles

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: sandy loam
E - 8 to 13 inches: sandy loam
Bt1 - 13 to 23 inches: sandy clay loam
Bt2 - 23 to 42 inches: sandy clay loam
BC - 42 to 55 inches: sandy loam
C - 55 to 79 inches: sandy loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 9.0
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Spinks

Percent of map unit: 2 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F098XA013MI - Piney Dry Sandy Drift Plains
Hydric soil rating: No

Locke

Percent of map unit: 1 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Houghton

Percent of map unit: 1 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Brookston

Percent of map unit: 1 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

42C—Riddles sandy loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 31gt8
Elevation: 920 to 1,160 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Riddles and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Riddles

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: sandy loam
E - 8 to 13 inches: sandy loam
Bt1 - 13 to 23 inches: sandy clay loam
Bt2 - 23 to 42 inches: sandy clay loam
BC - 42 to 55 inches: sandy loam
C - 55 to 79 inches: sandy loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 9.0
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Okee
Percent of map unit: 2 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Locke
Percent of map unit: 1 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston
Percent of map unit: 1 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Spinks
Percent of map unit: 1 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F098XA013MI - Piney Dry Sandy Drift Plains
Hydric soil rating: No

42D—Riddles sandy loam, 12 to 18 percent slopes

Map Unit Setting
National map unit symbol: 31gtb

Elevation: 920 to 1,160 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Riddles and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Riddles

Setting

Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Loamy till

Typical profile

A - 0 to 6 inches: sandy loam
E - 6 to 10 inches: sandy loam
Bt1 - 10 to 20 inches: sandy clay loam
Bt2 - 20 to 34 inches: sandy clay loam
BC - 34 to 50 inches: sandy loam
C - 50 to 79 inches: sandy loam

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 9.0
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Okee

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Locke

Percent of map unit: 2 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 1 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Spinks

Percent of map unit: 1 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F098XA013MI - Piney Dry Sandy Drift Plains
Hydric soil rating: No

43A—Dixboro very fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6bff
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Dixboro and similar soils: 88 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dixboro

Setting

Landform: Drainageways on outwash deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy and/or stratified sandy glaciofluvial deposits

Typical profile

H1 - 0 to 17 inches: very fine sandy loam
H2 - 17 to 52 inches: very fine sandy loam
H3 - 52 to 66 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Colwood

Percent of map unit: 7 percent
Landform: Drainageways on outwash deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Arkport

Percent of map unit: 5 percent
Landform: Flats on outwash deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

45—Martisco muck

Map Unit Setting

National map unit symbol: 6bfk
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Martisco and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Martisco

Setting

Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over marl

Typical profile

Oa - 0 to 8 inches: muck
Lma - 8 to 60 inches: marly material

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 90 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

Minor Components

Palms

Percent of map unit: 4 percent
Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Houghton

Percent of map unit: 3 percent
Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

47—Histosols and Aquents, ponded

Map Unit Setting

National map unit symbol: 6bfm
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Aquents and similar soils: 47 percent
Histosols and similar soils: 45 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Aquents

Setting

Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A/D
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Unranked

Description of Histosols

Setting

Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Organic material

Typical profile

Oa - 0 to 51 inches: muck
2C - 51 to 80 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Very high (about 21.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Unranked

Minor Components

Martisco

Percent of map unit: 4 percent
Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Dip

Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

Henrietta

Percent of map unit: 4 percent
Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

48—Napoleon muck

Map Unit Setting

National map unit symbol: 6bfn
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Napoleon and similar soils: 88 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Napoleon

Setting

Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material

Typical profile

Oa - 0 to 10 inches: muck
Oe - 10 to 60 inches: mucky peat

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 inches

Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 28.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A/D
Ecological site: F098XA007MI - Acidic Peaty Depressions
Hydric soil rating: Yes

Minor Components

Gilford

Percent of map unit: 5 percent
Landform: Drainageways on glacial drainage channels
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Houghton

Percent of map unit: 4 percent
Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Palms

Percent of map unit: 3 percent
Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

49E—Hillsdale-Riddles sandy loams, 18 to 30 percent slopes

Map Unit Setting

National map unit symbol: 31b2p
Elevation: 910 to 1,140 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Hillsdale and similar soils: 50 percent
Riddles and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hillsdale

Setting

Landform: End moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Coarse-loamy till

Typical profile

A - 0 to 8 inches: sandy loam
E - 8 to 12 inches: sandy loam
Bt - 12 to 45 inches: sandy loam
BC - 45 to 60 inches: sandy loam
C - 60 to 79 inches: sandy loam

Properties and qualities

Slope: 18 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 8.0
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Description of Riddles

Setting

Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Loamy till

Typical profile

A - 0 to 6 inches: sandy loam
E - 6 to 10 inches: sandy loam
Bt1 - 10 to 20 inches: sandy clay loam
Bt2 - 20 to 34 inches: sandy clay loam
BC - 34 to 50 inches: sandy loam
C - 50 to 79 inches: sandy loam

Properties and qualities

Slope: 18 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 9.0
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Spinks

Percent of map unit: 14 percent
Landform: Outwash deltas, outwash plains, moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Ecological site: F098XA021MI - Sandy Slopes
Hydric soil rating: No

Teasdale

Percent of map unit: 4 percent
Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Rise
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Locke

Percent of map unit: 2 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

51—Udorthents and Udipsamments, nearly level

Map Unit Setting

National map unit symbol: 6bft
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Udipsamments and similar soils: 51 percent
Udorthents and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udipsamments

Setting

Landform: Beaches, strand plains
Landform position (three-dimensional): Rise, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy glaciolacustrine deposits

Typical profile

H1 - 0 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Description of Udorthents

Setting

Landform: Moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

52—Pits, gravel

Map Unit Setting

National map unit symbol: 6bfv
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Pits, gravel: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits, Gravel

Setting

Landform: Ice-contact slopes, glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear

Across-slope shape: Convex

55B—Eleva sandy loam, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 6bfx
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Eleva and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Eleva

Setting

Landform: Flats on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till over sandstone

Typical profile

H1 - 0 to 16 inches: sandy loam
H2 - 16 to 29 inches: sandy loam
2Cr - 29 to 45 inches: bedrock
2R - 45 to 80 inches: bedrock

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: B
Ecological site: F098XA023MI - Sandstone Drift Plains
Hydric soil rating: No

Minor Components

Brady

Percent of map unit: 4 percent
Landform: Drainageways on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Teasdale

Percent of map unit: 3 percent
Landform: Flats on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

56D—Riddles-Leoni complex, 10 to 20 percent slopes

Map Unit Setting

National map unit symbol: 6bfz
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Riddles and similar soils: 50 percent
Leoni and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Riddles

Setting

Landform: Hills on ice-contact slopes, ridges on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 13 inches: sandy loam

H2 - 13 to 19 inches: sandy clay loam
H3 - 19 to 44 inches: clay loam
H4 - 44 to 60 inches: sandy loam

Properties and qualities

Slope: 10 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Description of Leoni

Setting

Landform: Hills on ice-contact slopes, ridges on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Gravelly loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 13 inches: gravelly sandy loam
H2 - 13 to 29 inches: gravelly sandy clay loam
H3 - 29 to 42 inches: gravelly sandy loam
H4 - 42 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 10 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Spinks

Percent of map unit: 10 percent
Landform: Hills on ice-contact slopes, ridges on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA021MI - Sandy Slopes
Hydric soil rating: No

Boyer

Percent of map unit: 10 percent
Landform: Hills on ice-contact slopes, ridges on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

63—Henrietta muck

Map Unit Setting

National map unit symbol: 6bg8
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Henrietta and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Henrietta

Setting

Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over loamy till

Typical profile

Oap - 0 to 12 inches: muck
Btg - 12 to 43 inches: stratified loamy fine sand to silt loam
Cg - 43 to 60 inches: stratified loamy fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Very high (about 12.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Colwood

Percent of map unit: 4 percent
Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Gilford

Percent of map unit: 3 percent
Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

64B—Marlette-Owosso complex, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 6bg9
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Marlette and similar soils: 50 percent
Owosso and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Marlette

Setting

Landform: Flats on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 12 inches: clay loam
H3 - 12 to 32 inches: clay loam
H4 - 32 to 60 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Description of Owosso

Setting

Landform: Flats on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 12 inches: sandy loam
H2 - 12 to 32 inches: sandy loam
H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Capac

Percent of map unit: 5 percent
Landform: Swales on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Teasdale

Percent of map unit: 5 percent
Landform: Drainageways on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Okee

Percent of map unit: 5 percent
Landform: Flats on till plains

Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

64C—Marlette-Owosso complex, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 6bgb
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Marlette and similar soils: 47 percent
Owosso and similar soils: 30 percent
Minor components: 23 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Marlette

Setting

Landform: Knolls on ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 12 inches: clay loam
H3 - 12 to 32 inches: clay loam
H4 - 32 to 60 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Description of Owosso

Setting

Landform: Knolls on ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 12 inches: sandy loam
H2 - 12 to 32 inches: sandy loam
H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Okee

Percent of map unit: 13 percent
Landform: Knolls on ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope

Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Capac

Percent of map unit: 10 percent
Landform: Knolls on ground moraines
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

65A—Capac loam, Lake Michigan lobe, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 2w63q
Elevation: 630 to 990 feet
Mean annual precipitation: 30 to 41 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Capac and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Capac

Setting

Landform: Moraines, till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 9 inches: loam
B/E - 9 to 16 inches: clay loam
Bt - 16 to 31 inches: clay loam
C - 31 to 80 inches: loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained

Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.1 to 0.4 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: High (about 9.5 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Parkhill, non dense till subsoil
Percent of map unit: 4 percent
Landform: Moraines, till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F097XA023MI - Wet Loamy Depression
Hydric soil rating: Yes

Selfridge
Percent of map unit: 3 percent
Landform: Moraines, till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA012MI - Moist Sandy Depression
Hydric soil rating: No

Marlette
Percent of map unit: 2 percent
Landform: Moraines, till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA022MI - Moist Loamy Drift Plains
Hydric soil rating: No

Filer
Percent of map unit: 1 percent
Landform: Moraines, till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope

Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F097XA018MI - Dry Loamy Drift Plains
Hydric soil rating: No

EdwadA—Edwards muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2zdl2
Elevation: 720 to 1,050 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Edwards and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Edwards

Setting

Landform: Lakebeds (relict) on glacial drainage channels, lakebeds (relict) on outwash plains, lakebeds (relict) on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Herbaceous organic material over marl

Typical profile

Oa1 - 0 to 9 inches: muck
Oa2 - 9 to 26 inches: muck
Lma - 26 to 80 inches: marly silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 100 percent
Gypsum, maximum content: 4 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0

Available water supply, 0 to 60 inches: Very high (about 20.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Houghton

Percent of map unit: 3 percent
Landform: Lakebeds (relict) on glacial drainage channels, lakebeds (relict) on outwash plains, lakebeds (relict) on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Adrian

Percent of map unit: 3 percent
Landform: Lakebeds (relict) on moraines, lakebeds (relict) on glacial drainage channels, lakebeds (relict) on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Palms

Percent of map unit: 2 percent
Landform: Drainageways on moraines, depressions on moraines, drainageways on glacial drainage channels, drainageways on moraines, drainageways on outwash plains, depressions on outwash plains, depressions on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Gilford

Percent of map unit: 2 percent
Landform: Lakebeds (relict) on moraines, lakebeds (relict) on glacial drainage channels, lakebeds (relict) on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

HgtahA—Houghton muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2zdlc
Elevation: 720 to 1,100 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Houghton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton

Setting

Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 80 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 3 percent
Maximum salinity: Nonsaline to very slightly saline (0.4 to 2.7 mmhos/cm)
Sodium adsorption ratio, maximum: 0.8
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D

Ecological site: R098XA002MI - Inland Salt Marshes, F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Adrian
Percent of map unit: 4 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Edwards
Percent of map unit: 3 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Palms
Percent of map unit: 2 percent
Landform: Depressions on moraines, swamps on moraines, drainageways on till plains, drainageways on moraines, drainageways on outwash plains, depressions on outwash plains, depressions on till plains, swamps on outwash plains, swamps on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Gilford, gravelly subsoil
Percent of map unit: 1 percent
Landform: Glacial drainage channels, glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA020MI - Wet Sandy Drift Depressions
Hydric soil rating: Yes

PmsacA—Palms muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 30n59
Elevation: 760 to 1,060 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Palms and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Palms

Setting

Landform: Depressions on moraines, swamps on outwash plains, swamps on till plains, drainageways on moraines, depressions on outwash plains, depressions on till plains, swamps on moraines, drainageways on outwash plains, drainageways on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Herbaceous organic material over loamy drift

Typical profile

Oa1 - 0 to 11 inches: muck
Oa2 - 11 to 28 inches: muck
Cg - 28 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 1.42 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 3.0
Available water supply, 0 to 60 inches: Very high (about 17.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Barry

Percent of map unit: 3 percent
Landform: Flats on till plains, depressions on moraines, drainageways on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Concave
Across-slope shape: Concave, linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Houghton

Percent of map unit: 2 percent
Landform: Drainageways on glacial drainage channels, drainageways on moraines, depressions on outwash plains, depressions on moraines, depressions on outwash plains, drainageways on moraines, drainageways on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Gilford, gravelly subsoil

Percent of map unit: 2 percent
Landform: Glacial drainage channels, glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA020MI - Wet Sandy Drift Depressions
Hydric soil rating: Yes

Edwards

Percent of map unit: 1 percent
Landform: Lakebeds (relict) on outwash plains, lakebeds (relict) on moraines, lakebeds (relict) on glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

W—Water

Map Unit Setting

National map unit symbol: 6bgj
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Lenawee County, Michigan

AaA—Adrian muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b27
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Adrian and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Adrian

Setting

Landform: Depressions on strand plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over sandy glaciofluvial deposits

Typical profile

Oa - 0 to 32 inches: muck
H2 - 32 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Very high (about 14.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

BaA—Barry sandy loam, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b28
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Barry and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Barry

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: sandy loam
H2 - 12 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BbA—Berrien loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b29
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BcB—Berrien sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2f
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

BcB2—Berrien sandy loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b2g
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien, Moderately Eroded

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BcC—Berrien sandy loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b2h
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BgA—Blount loam and Pewamo clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2q
Elevation: 580 to 1,530 feet
Mean annual precipitation: 29 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 60 percent
Pewamo and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 10 inches: silty clay loam
H3 - 10 to 26 inches: silty clay loam
H4 - 26 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Description of Pewamo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 16 inches: clay loam
H2 - 16 to 32 inches: silty clay loam
H3 - 32 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BhA—Brady sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2r
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Knolls on strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 5 percent
Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BkA—Brady and Macomb loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2s
Elevation: 600 to 1,200 feet

Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 46 percent
Macomb and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Macomb

Setting

Landform: Knolls on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 32 inches: loam

H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 10 percent
Landform: Strand plains, depressions
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BmA—Brady and Macomb sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2t
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 46 percent
Macomb and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Macomb

Setting

Landform: Knolls on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 32 inches: loam
H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BnA—Bronson sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2v
Elevation: 500 to 1,200 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Bronson and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bronson

Setting

Landform: Knolls on strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 38 inches: sandy loam
H3 - 38 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Brookston

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BnB—Bronson sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2w
Elevation: 500 to 1,200 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Bronson and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bronson

Setting

Landform: Knolls on strand plains

Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 38 inches: sandy loam
H3 - 38 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Brookston

Percent of map unit: 5 percent
Landform: Depressions on moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BntaaA—Blount loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wp2k
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, concave
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 30 inches: silty clay
BC - 30 to 37 inches: clay loam
Cd - 37 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 28 to 48 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 6 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Conover

Percent of map unit: 4 percent

Landform: End moraines, ground moraines
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Glynwood

Percent of map unit: 3 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Badaxe

Percent of map unit: 2 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

BntaaB—Blount loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2wp2l
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: End moraines, ground moraines
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 28 inches: silty clay
BC - 28 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 26 to 45 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Glynwood, eroded

Percent of map unit: 8 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Conover

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Depressions on end moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear

Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Badaxe

Percent of map unit: 2 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, convex
Across-slope shape: Linear
Hydric soil rating: No

BntabB—Blount loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wp2m
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount, eroded, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount, Eroded

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 7 inches: loam
Bt - 7 to 24 inches: silty clay
BC - 24 to 30 inches: clay loam
Cd - 30 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 24 to 40 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)

Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Glynwood, eroded

Percent of map unit: 8 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Conover

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Depressions, end moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Badaxe

Percent of map unit: 2 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, convex
Across-slope shape: Linear
Hydric soil rating: No

BoA—Brookston loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2x
Elevation: 500 to 1,020 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Brookston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brookston

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 23 inches: clay loam
H3 - 23 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BpA—Brookston loam, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2y
Elevation: 600 to 900 feet
Mean annual precipitation: 35 to 40 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 150 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Brookston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brookston

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 18 inches: clay loam
H3 - 18 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 11.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

ByB—Boyer loamy sand, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2t6l4
Elevation: 700 to 1,250 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Boyer and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boyer

Setting

Landform: Moraines, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Head slope, tread
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy outwash and/or sandy outwash over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: loamy sand
E - 9 to 17 inches: loamy sand
Bt - 17 to 30 inches: sandy loam
2C - 30 to 79 inches: stratified coarse sand to gravelly sand to very gravelly sand

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A

Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Minor Components

Oshtemo
Percent of map unit: 9 percent
Landform: Stream terraces, moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, tread
Down-slope shape: Linear
Across-slope shape: Convex, linear
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Bronson
Percent of map unit: 6 percent
Landform: Moraines, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

CaB—Cadmus loam, 3 to 7 percent slopes

Map Unit Setting
National map unit symbol: 6b2z
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting
Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile
H1 - 0 to 14 inches: loam
H2 - 14 to 34 inches: sandy loam

H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CaB2—Cadmus loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b30
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CarabA—Carlisle muck, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2zdk5
Elevation: 740 to 990 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Carlisle and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carlisle

Setting

Landform: Depressions on moraines, depressions on glacial drainage channels, depressions on outwash plains, depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Woody organic material

Typical profile

Oa1 - 0 to 13 inches: muck
Oa2 - 13 to 37 inches: muck
Oa3 - 37 to 80 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained

Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 0.6
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Linwood

Percent of map unit: 4 percent
Landform: Depressions on moraines, depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Wallkill

Percent of map unit: 4 percent
Landform: Depressions on glacial drainage channels, depressions on moraines, depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Adrian

Percent of map unit: 2 percent
Landform: Depressions on moraines, drainageways on moraines, drainageways on glacial drainage channels, drainageways on outwash plains, depressions on outwash plains, depressions on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

CaracA—Carlisle muck, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2zdl1
Elevation: 700 to 850 feet
Mean annual precipitation: 35 to 41 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Carlisle and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carlisle

Setting

Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material and/or woody organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 79 inches: woody muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very high (about 24.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Minor Components

Linwood

Percent of map unit: 9 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

Pewamo

Percent of map unit: 6 percent
Landform: Depressions on moraines, drainageways on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

CbA—Cadmus sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b31
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

CbB—Cadmus sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b32
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained

Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CcA—Cadmus and Blount loams, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b34
Elevation: 580 to 1,530 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Cadmus and similar soils: 46 percent
Blount and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting
Landform: Knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile
H1 - 0 to 14 inches: loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Description of Blount

Setting

Landform: Knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 10 inches: silty clay loam
H3 - 10 to 26 inches: silty clay loam
H4 - 26 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 10 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear

Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

CeA—Colwood very fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b36
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Colwood and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: very fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats

Hydric soil rating: Yes

CfA—Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b37
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Colwood and similar soils: 51 percent
Wauseon and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Wauseon

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

CgA—Conover loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b38
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Colwood

Percent of map unit: 5 percent
Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

CgB—Conover loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b39
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches

Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Colwood

Percent of map unit: 5 percent
Landform: Knolls on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

EaA—Edwards muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b3c
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Edwards and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Edwards

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over marl

Typical profile

Oa - 0 to 24 inches: muck
Lma - 24 to 60 inches: marly material

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 90 percent
Available water supply, 0 to 60 inches: Very high (about 14.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: R111XB002IN - Limnic Muck
Hydric soil rating: Yes

FaA—Fox cobbly gravelly loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b3d
Elevation: 800 to 1,000 feet
Mean annual precipitation: 34 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Fox and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: gravelly loam
H2 - 15 to 28 inches: very gravelly sandy clay loam
H3 - 28 to 32 inches: gravelly sandy loam
H4 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FbA—Fox loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b3h
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FbB—Fox loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b3j
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FbC—Fox loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b3k
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FbC2—Fox loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b3l
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FcA—Fox sandy loam, till plain, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wvh4
Elevation: 650 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Outwash plains, outwash terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest, tread
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loamy glaciofluvial deposits over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified sand to gravel

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B

Ecological site: R111XC010IN - Well Drained Overflow, F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Matherton
Percent of map unit: 6 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB403IN - Outwash Upland
Hydric soil rating: No

Sebewa
Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

FcB—Fox sandy loam, till plain, 2 to 6 percent slopes

Map Unit Setting
National map unit symbol: 2wvh5
Elevation: 650 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting
Landform: Outwash plains, outwash terraces
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest, tread
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loamy glaciofluvial deposits over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified sand to gravel

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

FcB2—Fox sandy loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b3p
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: sandy loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FcC—Fox sandy loam, Huron Lobe, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2wvh6
Elevation: 660 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Moraines, outwash plains, ice-contact slopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Loamy till over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified gravelly sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains

Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

FcC2—Fox sandy loam, Huron Lobe, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvh7
Elevation: 660 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox, eroded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Eroded

Setting

Landform: Ice-contact slopes, outwash plains, moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Loamy till over sandy and gravelly outwash

Typical profile

Ap - 0 to 8 inches: sandy loam

Bt1 - 8 to 26 inches: sandy clay loam
Bt2 - 26 to 31 inches: gravelly loam
2C - 31 to 79 inches: stratified gravelly sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R111XC010IN - Well Drained Overflow, F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB403IN - Outwash Upland
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

FcD—Fox sandy loam, Huron Lobe, 12 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2wvh8
Elevation: 650 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Outwash plains, moraines, ice-contact slopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loamy till over sandy and gravelly outwash

Typical profile

A - 0 to 9 inches: sandy loam
Bt1 - 9 to 22 inches: sandy clay loam
Bt2 - 22 to 30 inches: gravelly loam
2C - 30 to 79 inches: stratified gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B

Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Matherton
Percent of map unit: 6 percent
Landform: Drainageways, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sebewa
Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

FcD2—Fox sandy loam, 12 to 25 percent slopes, moderately eroded

Map Unit Setting
National map unit symbol: 6b3t
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition
Fox, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Moderately Eroded

Setting
Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: sandy loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

FcE—Fox sandy loam, 25+ percent slopes

Map Unit Setting

National map unit symbol: 6b3v
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Fox and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: sandy loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 25 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

FdC3—Fox soils, 7 to 15 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 6b3w
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox, severely eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Severely Eroded

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: clay loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

FdD3—Fox soils, 12 to 25 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 6b3x
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Fox, severely eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Severely Eroded

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: clay loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

FdE2—Fox soils, 25+ percent slopes, moderately or severely eroded

Map Unit Setting

National map unit symbol: 6b3y
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Fox, severely eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Severely Eroded

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: clay loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 25 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

GbA—Genesee sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b41
Elevation: 580 to 900 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam

H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F099XY008MI - Moist Floodplain
Hydric soil rating: No

GcA—Genesee and Eel loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b43
Elevation: 340 to 900 feet
Mean annual precipitation: 30 to 46 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 120 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee and similar soils: 51 percent
Eel and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

Description of Eel

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: loam
H3 - 20 to 60 inches: stratified sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

GeA—Granby sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b45
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Granby and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Granby

Setting

Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciofluvial deposits and/or sandy glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: fine sand
H3 - 36 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

GfA—Griffin and Genesee loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b46
Elevation: 580 to 1,000 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Genesee and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

GgA—Griffin and Sloan loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b47
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Sloan and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Sloan

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 22 inches: clay loam
H3 - 22 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Occasional

Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

GhA—Griffin and Sloan sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b48
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Sloan and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None

Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Sloan

Setting
Landform: Depressions on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile
H1 - 0 to 15 inches: loam
H2 - 15 to 22 inches: clay loam
H3 - 22 to 60 inches: loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

Gp—Gravel pits

Map Unit Composition
Gravel pits: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

HcA—Hoytville clay loam and silty clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4d
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silty clay loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

HfA—Hoytville and Wauseon loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4h
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 51 percent
Wauseon and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Wauseon

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

HgtahA—Houghton muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2zdlc
Elevation: 720 to 1,100 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Houghton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton

Setting

Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 80 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 3 percent
Maximum salinity: Nonsaline to very slightly saline (0.4 to 2.7 mmhos/cm)
Sodium adsorption ratio, maximum: 0.8
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R098XA002MI - Inland Salt Marshes, F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Adrian

Percent of map unit: 4 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Edwards

Percent of map unit: 3 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Palms

Percent of map unit: 2 percent
Landform: Depressions on moraines, swamps on moraines, drainageways on till plains, drainageways on moraines, drainageways on outwash plains, depressions on outwash plains, depressions on till plains, swamps on outwash plains, swamps on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Gilford, gravelly subsoil

Percent of map unit: 1 percent
Landform: Glacial drainage channels, glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA020MI - Wet Sandy Drift Depressions
Hydric soil rating: Yes

HgtaiA—Houghton muck, Erie-Huron lake plain, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2zdk6
Elevation: 630 to 820 feet
Mean annual precipitation: 30 to 37 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 185 days
Farmland classification: Farmland of local importance

Map Unit Composition

Houghton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton

Setting

Landform: Depressions on outwash plains, depressions on moraines on outwash plains

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 80 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 3 percent
Maximum salinity: Nonsaline to very slightly saline (0.4 to 2.7 mmhos/cm)
Sodium adsorption ratio, maximum: 0.8
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F099XY014MI - Mucky Depression
Hydric soil rating: Yes

Minor Components

Adrian

Percent of map unit: 4 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F099XY014MI - Mucky Depression
Hydric soil rating: Yes

Edwards

Percent of map unit: 3 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F099XY014MI - Mucky Depression
Hydric soil rating: Yes

Palms

Percent of map unit: 2 percent
Landform: Drainageways on moraines, drainageways on outwash plains, depressions on outwash plains, depressions on till plains, swamps on outwash plains, swamps on till plains, depressions on moraines, swamps on moraines, drainageways on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F099XY014MI - Mucky Depression
Hydric soil rating: Yes

Gilford, gravelly subsoil

Percent of map unit: 1 percent
Landform: Glacial drainage channels, glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA020MI - Wet Sandy Drift Depressions, F099XY012MI - Cool Wet Sandy Depression
Hydric soil rating: Yes

HgtanA—Houghton muck, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 30n5d
Elevation: 650 to 1,070 feet
Mean annual precipitation: 35 to 41 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Houghton, undrained, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton, Undrained

Setting

Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 79 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very high (about 24.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Minor Components

Palms, undrained

Percent of map unit: 8 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

Muskego, undrained

Percent of map unit: 7 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB002IN - Limnic Muck
Hydric soil rating: Yes

IaA—Ionia loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4j
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ionia and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ionia

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

IaB—Ionia loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b4k
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ionia and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ionia

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

KaC—Kendallville loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b4l
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

KaC2—Kendallville loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b4m
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

KbC—Kendallville sandy loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b4n
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

KcC2—Kendallville soils, 7 to 15 percent slopes, moderately or severely eroded

Map Unit Setting

National map unit symbol: 6b4p
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: clay loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge

Hydric soil rating: No

KdA—Kerston muck and loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4q
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Kerston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kerston

Setting

Landform: Depressions on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over alternating layers of alluvium and/or organic material

Typical profile

Oa1 - 0 to 8 inches: muck
Oa2 - 8 to 15 inches: muck
H3 - 15 to 42 inches: stratified fine sand to silty clay loam
O'a - 42 to 50 inches: muck
H5 - 50 to 60 inches: stratified fine sand to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 14.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

KfA—Kokomo and Barry loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4t
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Kokomo and similar soils: 51 percent
Barry and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kokomo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 31 inches: silty clay loam
H3 - 31 to 60 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Barry

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

KgA—Kokomo, Barry, and Wallkill loams, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4v
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kokomo and similar soils: 40 percent
Barry and similar soils: 30 percent
Wallkill and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kokomo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 31 inches: silty clay loam
H3 - 31 to 60 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Barry

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None

Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Wallkill

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over organic material

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: fine sandy loam
Oa - 20 to 60 inches: muck

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 19.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

LaA—Lake borders

Map Unit Composition

Lake borders: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lake Borders

Setting

Landform: Beaches

LcA—Linwood muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4y
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 32 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Linwood and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Linwood

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Woody organic material over loamy till

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 31 inches: muck
H3 - 31 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 17.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

Le—Lenawee silty clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2wcf7
Elevation: 560 to 980 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 230 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Lenawee and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lenawee

Setting

Landform: Lakebeds (relict)
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey glaciolacustrine deposits

Typical profile

Ap - 0 to 9 inches: silty clay loam
Bg - 9 to 39 inches: silty clay loam
Cg - 39 to 80 inches: silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 21 percent
Maximum salinity: Nonsaline (0.0 to 0.6 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Del rey

Percent of map unit: 7 percent
Landform: Lakebeds (relict)
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Linear, convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

MaA—Macomb fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b50
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Macomb and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Macomb

Setting

Landform: Drainageways on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 32 inches: sandy clay loam
H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent

Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

MbA—Macomb sandy clay loam and Hoytville clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b51
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Macomb and similar soils: 51 percent
Hoytville and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Macomb

Setting

Landform: Drainageways on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 32 inches: sandy clay loam
H3 - 32 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

McA—Maumee loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b52
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Maumee and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Maumee

Setting

Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy glaciofluvial deposits and/or sandy glaciolacustrine deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 60 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

MdA—Miami loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b53
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 141 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Miami and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

MeD—Miami loam and Boyer sandy loam, 12 to 25 percent slopes

Map Unit Setting

National map unit symbol: 6b59
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Miami and similar soils: 51 percent
Boyer and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Description of Boyer

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

MeD2—Miami loam and Boyer sandy loam, 12 to 25 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b5b
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Miami, moderately eroded, and similar soils: 60 percent
Boyer, moderately eroded, and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami, Moderately Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam

H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Description of Boyer, Moderately Eroded

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

MeE—Miami loam and Boyer sandy loam, 25+ percent slopes

Map Unit Setting

National map unit symbol: 6b5c
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Miami and similar soils: 60 percent
Boyer and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Description of Boyer

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

MfD3—Miami soils, 15 to 25 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 6b5f

Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 141 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Miami, severely eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami, Severely Eroded

Setting
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile
H1 - 0 to 12 inches: clay loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities
Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

MgD3—Miami and Boyer soils, 12 to 25 percent slopes, severely eroded

Map Unit Setting
National map unit symbol: 6b5g
Elevation: 600 to 1,200 feet

Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Miami, severely eroded, and similar soils: 51 percent
Boyer, severely eroded, and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami, Severely Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Description of Boyer, Severely Eroded

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

MgE2—Miami and Boyer soils, 25+ percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b5h
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Miami, moderately eroded, and similar soils: 51 percent
Boyer, moderately eroded, and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami, Moderately Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Description of Boyer, Moderately Eroded

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

MhA—Morley loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b5j
Elevation: 580 to 1,400 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Morley and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhB—Glynwood loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2v4bq
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 31 inches: clay
BC - 31 to 35 inches: clay loam

Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 28 to 45 inches to densic material
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Rawson

Percent of map unit: 6 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhB2—Glynwood loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2v4br
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 7 inches: loam
Bt - 7 to 26 inches: clay
BC - 26 to 30 inches: clay loam
Cd - 30 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 25 to 37 inches to densic material
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge

Hydric soil rating: No

Minor Components

Rawson

Percent of map unit: 6 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhC—Morley loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2wp25
Elevation: 570 to 1,120 feet
Mean annual precipitation: 32 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till

Typical profile

Ap - 0 to 9 inches: loam
Bt1 - 9 to 18 inches: clay
Bt2 - 18 to 29 inches: clay
BC - 29 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 26 to 40 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood

Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear

Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhC2—Morley loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wp26
Elevation: 750 to 1,220 feet
Mean annual precipitation: 32 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 165 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 17 inches: clay
Bt2 - 17 to 28 inches: clay
BC - 28 to 33 inches: clay loam
Cd - 33 to 79 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 24 to 38 inches to densic material
Drainage class: Well drained
Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood

Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhD—Morley loam, 12 to 25 percent slopes

Map Unit Setting

National map unit symbol: 6b5p
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MhD2—Morley loam, 12 to 25 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b5q
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Moderately Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MkC3—Morley soils, 7 to 15 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 6b5t
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley, severely eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Severely Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MkD3—Morley clay loam, 12 to 18 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 2wvhl
Elevation: 720 to 1,120 feet
Mean annual precipitation: 35 to 40 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 160 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley, severely eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Severely Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 7 inches: clay loam
Bt - 7 to 25 inches: clay
BC - 25 to 33 inches: clay loam
Cd - 33 to 79 inches: clay loam

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: 26 to 45 inches to densic material
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hennepin, severely eroded
Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Glynwood, severely eroded
Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount
Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

NaA—Nappanee silt loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b5x
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

NaB—Nappanee silt loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b5y
Elevation: 600 to 800 feet

Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

NaB2—Nappanee silt loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b5z
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee, Moderately Eroded

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

NbB—Nappanee loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b60
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

NbB2—Nappanee loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b61
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee, Moderately Eroded

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

OaA—Ogden muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b62
Elevation: 600 to 1,500 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Ogden and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ogden

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Dip

Down-slope shape: Linear
Across-slope shape: Linear

Typical profile
Oa - 0 to 30 inches: muck
H2 - 30 to 60 inches: silty clay

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Very high (about 16.2 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

ObA—Oshtemo loamy sand, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b63
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition
Oshtemo and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oshtemo

Setting
Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy and/or sandy glaciofluvial deposits

Typical profile
H1 - 0 to 14 inches: loamy sand
H2 - 14 to 45 inches: sandy loam

H3 - 45 to 60 inches: stratified sand to gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

ObB—Oshtemo loamy sand, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b64
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Oshtemo and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oshtemo

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy and/or sandy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: loamy sand
H2 - 14 to 45 inches: sandy loam
H3 - 45 to 60 inches: stratified gravelly sand to sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

ObB2—Oshtemo loamy sand, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b65
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Oshtemo, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oshtemo, Moderately Eroded

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy and/or sandy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: loamy sand
H2 - 14 to 45 inches: sandy loam
H3 - 45 to 60 inches: stratified gravelly sand to sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

ObC—Oshtemo loamy sand, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b66
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Oshtemo and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oshtemo

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy and/or sandy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: loamy sand
H2 - 14 to 45 inches: sandy loam
H3 - 45 to 60 inches: stratified gravelly sand to sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

PaA—Palms muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b68
Elevation: 250 to 1,500 feet
Mean annual precipitation: 30 to 45 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Palms and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Palms

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material and/or loamy till

Typical profile

Oa1 - 0 to 13 inches: muck
Oa2 - 13 to 32 inches: muck
H3 - 32 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Very high (about 17.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

PbA—Pewamo clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t6lz
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 205 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on till plains, drainageways on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 11 inches: clay loam
Btg1 - 11 to 34 inches: clay
Btg2 - 34 to 47 inches: clay loam
BCg - 47 to 57 inches: clay loam
Cg - 57 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 8 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Brookston

Percent of map unit: 4 percent
Landform: Drainageways on till plains, depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Palms, undrained

Percent of map unit: 3 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

PcA—Pewamo mucky clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6b
Elevation: 600 to 1,400 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Pewamo and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: mucky silty clay loam
H2 - 7 to 32 inches: clay loam
H3 - 32 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

PdA—Plainfield and Berrien loamy sands, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6c
Elevation: 600 to 1,150 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 51 percent
Berrien and similar soils: 49 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

PeA—Plainfield and Ottawa loamy sands, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b6f
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition
Plainfield and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting
Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile
H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PeC—Plainfield and Ottawa loamy sands, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b6j
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Beach ridges
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PeC2—Plainfield and Ottawa loamy sands, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6k
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield, Moderately Eroded

Setting

Landform: Beach ridges
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PwmaaA—Pewamo clay loam, dense substratum, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2qz3f
Elevation: 670 to 830 feet
Mean annual precipitation: 31 to 36 inches
Mean annual air temperature: 47 to 49 degrees F
Frost-free period: 143 to 182 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo, dense substratum, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo, Dense Substratum

Setting

Landform: Drainageways on nearshore zones (relict), flats on nearshore zones (relict)
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over dense till

Typical profile

Ap - 0 to 11 inches: clay loam
Btg - 11 to 39 inches: clay loam
BCg - 39 to 56 inches: clay loam
2Cd - 56 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 30 to 70 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D

Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Metamora, dense substratum
Percent of map unit: 12 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Blount
Percent of map unit: 4 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Gilford, loamy substratum
Percent of map unit: 2 percent
Landform: Drainageways on nearshore zones (relict), depressions on nearshore zones (relict)
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Selfridge, dense substratum
Percent of map unit: 2 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

RaA—Rifle peat, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b6l
Elevation: 810 to 850 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 130 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Rifle and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rifle

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Woody organic material

Typical profile

Oa - 0 to 14 inches: muck
Oe - 14 to 60 inches: mucky peat

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

RbA—Rollin muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6m
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Rollin and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rollin

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over marl

Typical profile

Oa - 0 to 30 inches: muck
Lma - 30 to 60 inches: marly material

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 90 percent
Available water supply, 0 to 60 inches: Very high (about 15.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

SbA—Sebewa sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6p
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Sebewa and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sebewa

Setting

Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Talf

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 30 inches: sandy clay loam
H3 - 30 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

SdC2—St. Clair loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6x
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

St. clair, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair, Moderately Eroded

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest

Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

SdD2—St. Clair loam, 12 to 25 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6y
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

St. clair, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair, Moderately Eroded

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

Sf—Sebewa loam, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2v4bw
Elevation: 570 to 1,070 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 110 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Sebewa and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sebewa

Setting

Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy drift over sandy and gravelly outwash

Typical profile

Ap - 0 to 11 inches: loam
Btg1 - 11 to 21 inches: clay loam
Btg2 - 21 to 33 inches: clay loam
2Cg - 33 to 79 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 23 to 39 inches to strongly contrasting textural stratification
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 45 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 3.0
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: B/D
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Minor Components

Matherton
Percent of map unit: 6 percent
Landform: Drainageways, drainageways on stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Gilford
Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Sg—Sewage lagoons

Map Unit Composition
Sewage lagoons: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

TaA—Tawas muck, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b72
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition
Tawas and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tawas

Setting

Landform: Depressions on strand plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Woody organic material over sandy glaciofluvial deposits

Typical profile

Oa - 0 to 28 inches: muck
H2 - 28 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Very high (about 13.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

Ud—Udorthents, nearly level and undulating

Map Unit Setting

National map unit symbol: 1bxsy
Elevation: 580 to 1,110 feet
Mean annual precipitation: 27 to 32 inches
Mean annual air temperature: 43 to 46 degrees F
Frost-free period: 95 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Landform: Moraines
Landform position (three-dimensional): Rise

Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile
H1 - 0 to 80 inches: silty clay loam

Properties and qualities
Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Hydrologic Soil Group: C
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

W—Water

Map Unit Composition
Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

WaA—Wallkill loam, overwashed, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b73
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Wallkill and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wallkill

Setting
Landform: Depressions on flood plains

Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over organic material

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: fine sandy loam
Oa - 20 to 60 inches: muck

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 19.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

WawaaC—Wawasee clay loam, 6 to 12 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 2wp21
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear

Parent material: Loamy till

Typical profile

Ap - 0 to 6 inches: clay loam
Bt1 - 6 to 21 inches: loam
Bt2 - 21 to 29 inches: clay loam
C - 29 to 79 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawabB—Wawasee loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2wp1x
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 9 inches: loam
Bt1 - 9 to 24 inches: loam
Bt2 - 24 to 33 inches: clay loam
C - 33 to 79 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains

Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawabC—Wawasee loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2wvgl
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: loam

Bt1 - 8 to 24 inches: loam
Bt2 - 24 to 33 inches: clay loam
C - 33 to 79 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawacB—Wawasee loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvgk

Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 24 inches: loam
Bt2 - 24 to 32 inches: clay loam
C - 32 to 79 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawacC—Wawasee loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvgm
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 7 inches: loam
Bt1 - 7 to 23 inches: loam
Bt2 - 23 to 31 inches: clay loam
C - 31 to 79 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawadD—Wawasee loam, 12 to 25 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvgr
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Wawasee and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 7 inches: loam
Bt1 - 7 to 23 inches: loam
Bt2 - 23 to 31 inches: clay loam
C - 31 to 79 inches: loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 6 percent
Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 4 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave

Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WbA—Warners muck and marl, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b74
Elevation: 50 to 1,200 feet
Mean annual precipitation: 28 to 45 inches
Mean annual air temperature: 39 to 54 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Warners and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Warners

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium over marl

Typical profile

Oa - 0 to 10 inches: muck
Lma - 10 to 60 inches: marly material

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 90 percent
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

WcA—Wauseon loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b75
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Wauseon and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wauseon

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

WdA—Willette muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b76
Elevation: 600 to 1,500 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Willette and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Willette

Setting

Landform: Depressions, depressions
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Organic material over loamy till and/or lacustrine deposits

Typical profile

Oa - 0 to 30 inches: muck
H2 - 30 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Very high (about 16.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

YpA—Ypsi sandy loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 6fgj
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Ypsi and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ypsi

Setting

Landform: Drainageways on lake plains, drainageways on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 9 inches: sandy loam
H2 - 9 to 37 inches: sandy loam
H3 - 37 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Wauseon

Percent of map unit: 3 percent

Landform: Depressions on ground moraines, depressions on lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Seward

Percent of map unit: 3 percent
Landform: Knolls on outwash plains, knolls on ground moraines, knolls on till plains, knolls on lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Seward

Percent of map unit: 3 percent
Landform: Knolls on till plains, knolls on ground moraines, knolls on lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Fox

Percent of map unit: 2 percent
Landform: Knolls on moraines, knolls on kames, knolls on outwash plains, knolls on terraces, knolls on valley trains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Nappanee

Percent of map unit: 2 percent
Landform: Flats on lake plains, flats on moraines, flats on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Wasepi

Percent of map unit: 2 percent
Landform: Drainageways on lake plains, drainageways on deltas, drainageways on glacial drainage channels, drainageways on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

ZfsacA—Ziegenfuss clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2qz3g
Elevation: 570 to 790 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Ziegenfuss and similar soils: 86 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ziegenfuss

Setting

Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over loamy till

Typical profile

Ap - 0 to 9 inches: clay loam
Bg - 9 to 30 inches: clay loam
BC - 30 to 40 inches: clay loam
C - 40 to 67 inches: clay loam
2Cd - 67 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 60 to 80 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 28 percent
Maximum salinity: Nonsaline (0.1 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats

Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 9 percent
Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Houcktown

Percent of map unit: 5 percent
Landform: Wave-worked till plains
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Washtenaw County, Michigan

Ad—Adrian muck

Map Unit Setting

National map unit symbol: 6fct
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Adrian and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Adrian

Setting

Landform: Depressions on moraines, depressions on lake plains, depressions on outwash plains, depressions on till plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

Oa - 0 to 26 inches: muck
H2 - 26 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Very high (about 12.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Granby

Percent of map unit: 2 percent
Landform: Depressions on lake plains, depressions on outwash plains
Landform position (three-dimensional): Talf

Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA020MI - Wet Sandy Drift Depressions
Hydric soil rating: Yes

Edwards

Percent of map unit: 2 percent
Landform: Depressions on outwash plains, depressions on lake plains, depressions on till plains, depressions on moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Gilford

Percent of map unit: 2 percent
Landform: Depressions on deltas, depressions on lake plains, depressions on outwash plains, depressions on valley trains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Houghton

Percent of map unit: 2 percent
Landform: Depressions on outwash plains, depressions on lake plains, depressions on till plains, depressions on moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

BnC—Boyer loamy sand, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2t6l3
Elevation: 700 to 1,250 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Boyer and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boyer

Setting

Landform: Moraines, stream terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, riser
Down-slope shape: Linear
Across-slope shape: Linear, convex
Parent material: Loamy outwash and/or sandy outwash over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: loamy sand
E - 9 to 17 inches: loamy sand
Bt - 17 to 30 inches: sandy loam
2C - 30 to 79 inches: stratified coarse sand to gravelly sand to very gravelly sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Minor Components

Oshtemo

Percent of map unit: 9 percent
Landform: Moraines, stream terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, riser
Down-slope shape: Linear
Across-slope shape: Linear, convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Spinks

Percent of map unit: 6 percent
Landform: Stream terraces, moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, riser

Down-slope shape: Linear
Across-slope shape: Convex, linear
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

BnE—Boyer loamy sand, 18 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2t6l6
Elevation: 800 to 1,100 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Boyer and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boyer

Setting

Landform: Moraines, stream terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, riser
Down-slope shape: Linear
Across-slope shape: Linear, convex
Parent material: Loamy outwash and/or sandy outwash over sandy and gravelly outwash

Typical profile

A - 0 to 7 inches: loamy sand
E - 7 to 15 inches: loamy sand
Bt - 15 to 28 inches: sandy loam
2C - 28 to 79 inches: stratified coarse sand to gravelly sand to very gravelly sand

Properties and qualities

Slope: 18 to 25 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: F098XA021MI - Sandy Slopes
Hydric soil rating: No

Minor Components

Spinks

Percent of map unit: 9 percent
Landform: Stream terraces, moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, riser
Down-slope shape: Linear
Across-slope shape: Convex, linear
Ecological site: F098XA021MI - Sandy Slopes
Hydric soil rating: No

Oshtemo

Percent of map unit: 6 percent
Landform: Stream terraces, moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, riser
Down-slope shape: Linear
Across-slope shape: Convex, linear
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

BnF—Boyer loamy sand, 25 to 50 percent slopes

Map Unit Setting

National map unit symbol: 2t6l7
Elevation: 800 to 1,100 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Boyer and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boyer

Setting

Landform: Moraines, stream terraces
Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope, riser
Down-slope shape: Linear
Across-slope shape: Linear, convex
Parent material: Loamy outwash and/or sandy outwash over sandy and gravelly outwash

Typical profile

A - 0 to 7 inches: loamy sand
E - 7 to 15 inches: loamy sand
Bt - 15 to 28 inches: sandy loam
2C - 28 to 79 inches: stratified coarse sand to gravelly sand to very gravelly sand

Properties and qualities

Slope: 25 to 50 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: F098XA021MI - Sandy Slopes
Hydric soil rating: No

Minor Components

Spinks

Percent of map unit: 9 percent
Landform: Stream terraces, moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, riser
Down-slope shape: Linear
Across-slope shape: Convex, linear
Ecological site: F098XA021MI - Sandy Slopes
Hydric soil rating: No

Oshtemo

Percent of map unit: 6 percent
Landform: Stream terraces, moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, riser
Down-slope shape: Linear
Across-slope shape: Convex, linear
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

BntaaB—Blount loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2wp2l
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 28 inches: silty clay
BC - 28 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 26 to 45 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge

Hydric soil rating: No

Minor Components

Glynwood, eroded

Percent of map unit: 8 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, nose slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Conover

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Depressions on end moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Badaxe

Percent of map unit: 2 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Linear
Hydric soil rating: No

BoE—Boyer-Kidder complex, 15 to 35 percent slopes

Map Unit Setting

National map unit symbol: 6fd2
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Boyer and similar soils: 50 percent
Kidder and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boyer

Setting

Landform: Escarpments on ice-contact slopes
Landform position (two-dimensional): Footslope, toeslope, backslope, shoulder, summit
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Typical profile

H1 - 0 to 8 inches: loamy sand
H2 - 8 to 18 inches: loamy sand
H3 - 18 to 32 inches: sandy loam
H4 - 32 to 60 inches: gravelly coarse sand

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: F098XA021MI - Sandy Slopes
Hydric soil rating: No

Description of Kidder

Setting

Landform: Escarpments on ice-contact slopes
Landform position (two-dimensional): Footslope, toeslope, backslope, shoulder, summit
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Typical profile

H1 - 0 to 13 inches: sandy loam
H2 - 13 to 36 inches: sandy clay loam
H3 - 36 to 60 inches: sandy loam

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Fox

Percent of map unit: 4 percent
Landform: Escarpments on valley trains, escarpments on terraces, escarpments on outwash plains, escarpments on kames, escarpments on ice-contact slopes
Landform position (two-dimensional): Footslope, toeslope, backslope, shoulder, summit
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Oshtemo

Percent of map unit: 4 percent
Landform: Hills on beach ridges, hills on ice-contact slopes, hills on valley trains, hills on outwash plains
Landform position (two-dimensional): Footslope, toeslope, backslope, shoulder, summit
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Spinks

Percent of map unit: 4 percent

Landform: Escarpments on ice-contact slopes, escarpments on terraces, escarpments on valley trains, escarpments on outwash plains
Landform position (two-dimensional): Footslope, toeslope, backslope, shoulder, summit
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA021MI - Sandy Slopes
Hydric soil rating: No

Riddles

Percent of map unit: 3 percent
Landform: Hills on ice-contact slopes, hills on till plains
Landform position (two-dimensional): Toeslope, backslope, shoulder, footslope, summit
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Br—Brookston loam

Map Unit Setting

National map unit symbol: 6fd3
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Brookston and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brookston

Setting

Landform: Depressions on till plains, depressions on moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 36 inches: clay loam

H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Minor Components

Sebewa

Percent of map unit: 3 percent
Landform: Depressions on outwash plains, depressions on valley trains, drainageways on terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Pewamo

Percent of map unit: 3 percent
Landform: Depressions on lake plains, depressions on till plains, depressions on moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Conover

Percent of map unit: 2 percent
Landform: Knolls on moraines, knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Hoytville

Percent of map unit: 2 percent
Landform: Depressions on till plains, depressions on lake plains
Landform position (three-dimensional): Talf

Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

CoB—Conover loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 6fd5
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Knolls on moraines, knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 27 inches: clay loam
H3 - 27 to 60 inches: loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F098XA011MI - Moist Loamy Drift Plains

Hydric soil rating: No

Minor Components

Metamora

Percent of map unit: 3 percent
Landform: Drainageways on till plains, drainageways on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Blount

Percent of map unit: 3 percent
Landform: Flats on moraines, flats on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Miami

Percent of map unit: 2 percent
Landform: Knolls on till plains, knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 2 percent
Landform: Depressions on till plains, depressions on moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

CpA—Conover-Brookston loams, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 6fd6
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 55 percent
Brookston and similar soils: 35 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Flats on moraines, flats on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 27 inches: clay loam
H3 - 27 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Description of Brookston

Setting

Landform: Depressions on till plains, depressions on moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 4 percent
Landform: Flats on moraines, flats on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Metamora

Percent of map unit: 4 percent
Landform: Drainageways on till plains, drainageways on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Miami

Percent of map unit: 2 percent
Landform: Knolls on till plains, knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

FoB—Fox sandy loam, till plain, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2wvh5
Elevation: 650 to 1,250 feet
Mean annual precipitation: 31 to 40 inches

Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Outwash terraces, outwash plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest, tread
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Loamy glaciofluvial deposits over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified sand to gravel

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways, drainageways on stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains

Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Drainageways, drainageways on stream terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

FoC—Fox sandy loam, Huron Lobe, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2wvh6
Elevation: 660 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Ice-contact slopes, outwash plains, moraines
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Loamy till over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified gravelly sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Stream terraces, drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

FoD—Fox sandy loam, 12 to 18 percent slopes

Map Unit Setting

National map unit symbol: 6fdg
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Ridges on valley trains, ridges on terraces, ridges on outwash plains, ridges on kames, ridges on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 39 inches: gravelly sandy clay loam
H3 - 39 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Fox

Percent of map unit: 3 percent
Landform: Ridges on valley trains, ridges on terraces, ridges on outwash plains, ridges on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Matherton

Percent of map unit: 3 percent
Landform: Drainageways on valley trains, drainageways on ice-contact slopes, drainageways on outwash plains

Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Boyer

Percent of map unit: 3 percent
Landform: Ridges on ice-contact slopes, ridges on valley trains, ridges on kames, ridges on outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA021MI - Sandy Slopes
Hydric soil rating: No

Miami

Percent of map unit: 3 percent
Landform: Ridges on ice-contact slopes, ridges on till plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Side slope, crest, base slope, nose slope, head slope, interfluve
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Kendallville

Percent of map unit: 3 percent
Landform: Hills on till plains, hills on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

FoE—Fox sandy loam, 18 to 25 percent slopes

Map Unit Setting

National map unit symbol: 6fdh
Elevation: 570 to 980 feet

Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Fox and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Escarpments on valley trains, escarpments on terraces, escarpments on outwash plains, escarpments on kames, escarpments on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Side slope, crest, base slope, nose slope, head slope, interfluve
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 39 inches: gravelly sandy clay loam
H3 - 39 to 60 inches: gravelly sand

Properties and qualities

Slope: 18 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Miami

Percent of map unit: 4 percent
Landform: Escarpments on ice-contact slopes, escarpments on till plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve

Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Kidder

Percent of map unit: 4 percent
Landform: Ridges on ice-contact slopes, ridges on till plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Boyer

Percent of map unit: 4 percent
Landform: Escarpments on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA021MI - Sandy Slopes
Hydric soil rating: No

Fox

Percent of map unit: 3 percent
Landform: Ridges on valley trains, ridges on terraces, ridges on outwash plains, ridges on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

HgtahA—Houghton muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2zdlc
Elevation: 720 to 1,100 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days

Farmland classification: Farmland of local importance

Map Unit Composition

Houghton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton

Setting

Landform: Depressions on moraines on outwash plains, depressions on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 80 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 3 percent
Maximum salinity: Nonsaline to very slightly saline (0.4 to 2.7 mmhos/cm)
Sodium adsorption ratio, maximum: 0.8
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R098XA002MI - Inland Salt Marshes, F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Adrian

Percent of map unit: 4 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions

Hydric soil rating: Yes

Edwards

Percent of map unit: 3 percent
Landform: Depressions on moraines on outwash plains, depressions on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Palms

Percent of map unit: 2 percent
Landform: Swamps on till plains, swamps on outwash plains, depressions on till plains, depressions on outwash plains, drainageways on outwash plains, drainageways on moraines, drainageways on till plains, swamps on moraines, depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Gilford, gravelly subsoil

Percent of map unit: 1 percent
Landform: Glacial drainage channels, glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA020MI - Wet Sandy Drift Depressions
Hydric soil rating: Yes

HgtanA—Houghton muck, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 30n5d
Elevation: 650 to 1,070 feet
Mean annual precipitation: 35 to 41 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Houghton, undrained, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton, Undrained

Setting

Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 79 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very high (about 24.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Minor Components

Palms, undrained

Percent of map unit: 8 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

Muskego, undrained

Percent of map unit: 7 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB002IN - Limnic Muck

Hydric soil rating: Yes

KeC—Kendallville loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 6fds
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville

Setting

Landform: Hills on till plains, hills on moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 20 inches: loam
H3 - 20 to 38 inches: gravelly clay loam
H4 - 38 to 60 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C

Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Miami

Percent of map unit: 3 percent
Landform: Hills on moraines, hills on till plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Nose slope, head slope, interfluve, base slope, side slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Macomb

Percent of map unit: 3 percent
Landform: Drainageways on lake plains, drainageways on moraines
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Fox

Percent of map unit: 3 percent
Landform: Hills on valley trains, hills on terraces, hills on outwash plains, hills on kames, hills on moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Owosso

Percent of map unit: 3 percent
Landform: Hills on moraines, hills on till plains
Landform position (two-dimensional): Toeslope, footslope, backslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest, base slope, interfluve, head slope, nose slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Morley

Percent of map unit: 3 percent
Landform: Hills on moraines, hills on till plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope

Landform position (three-dimensional): Side slope, crest, base slope, interfluve, head slope, nose slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

KnA—Kibbie fine sandy loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 6fdt
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Kibbie and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kibbie

Setting

Landform: Drainageways on outwash deltas, drainageways on lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 12 inches: fine sandy loam
H2 - 12 to 29 inches: sandy clay loam
H3 - 29 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 10.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: B/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Pella
Percent of map unit: 3 percent
Landform: Depressions on till-floored lake plains, depressions on outwash plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Colwood
Percent of map unit: 3 percent
Landform: Depressions on outwash deltas, depressions on lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Dixboro
Percent of map unit: 2 percent
Landform: Knolls on outwash deltas, knolls on lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Sisson
Percent of map unit: 2 percent
Landform: Knolls on lake plains, knolls on outwash deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

KrB—Kidder sandy loam, 2 to 6 percent slopes

Map Unit Setting
National map unit symbol: 6fdv
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Kidder and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kidder

Setting

Landform: Knolls on till plains, knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 13 inches: sandy loam
H2 - 13 to 36 inches: sandy clay loam
H3 - 36 to 60 inches: sandy loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Riddles

Percent of map unit: 4 percent
Landform: Knolls on till plains, knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Miami

Percent of map unit: 4 percent
Landform: Knolls on till plains, knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains

Hydric soil rating: No

Owosso

Percent of map unit: 4 percent
Landform: Knolls on till plains, knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Conover

Percent of map unit: 3 percent
Landform: Knolls on moraines, knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

KrC—Kidder sandy loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 6fdw
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kidder and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kidder

Setting

Landform: Hills on moraines, hills on till plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Side slope, base slope, crest, interfluve, head slope, nose slope
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 13 inches: sandy loam
H2 - 13 to 36 inches: sandy clay loam
H3 - 36 to 60 inches: sandy loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Riddles

Percent of map unit: 4 percent
Landform: Hills on moraines, hills on till plains
Landform position (two-dimensional): Toeslope, footslope, backslope, shoulder, summit
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Owosso

Percent of map unit: 4 percent
Landform: Hills on moraines, hills on till plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Miami

Percent of map unit: 4 percent
Landform: Hills on moraines, hills on till plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Head slope, nose slope, side slope, base slope, crest, interfluve
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains

Hydric soil rating: No

Conover

Percent of map unit: 3 percent
Landform: Knolls on moraines, knolls on till plains
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

KrD—Kidder sandy loam, 12 to 18 percent slopes

Map Unit Setting

National map unit symbol: 6fdx
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kidder and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kidder

Setting

Landform: Ridges on moraines, ridges on till plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Side slope, base slope, crest, interfluve, head slope, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Typical profile

H1 - 0 to 13 inches: sandy loam
H2 - 13 to 36 inches: sandy clay loam
H3 - 36 to 60 inches: sandy loam

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Riddles

Percent of map unit: 4 percent
Landform: Hills on moraines, hills on till plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Side slope, base slope, crest, interfluve, head slope, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Miami

Percent of map unit: 4 percent
Landform: Ridges on moraines, ridges on till plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Side slope, base slope, crest, interfluve, head slope, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Boyer

Percent of map unit: 4 percent
Landform: Ridges on terraces, ridges on valley trains, ridges on kames, ridges on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Side slope, base slope, crest, interfluve, head slope, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA021MI - Sandy Slopes
Hydric soil rating: No

Spinks

Percent of map unit: 3 percent
Landform: Ridges on moraines, ridges on terraces, ridges on valley trains, ridges on outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope

Landform position (three-dimensional): Side slope, base slope, crest, interfluve, head slope, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA021MI - Sandy Slopes
Hydric soil rating: No

MdA—Matherton sandy loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 6ff2
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Matherton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Matherton

Setting

Landform: Drainageways on glacial drainage channels, drainageways on terraces, drainageways on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 9 inches: sandy loam
H2 - 9 to 32 inches: gravelly sandy clay loam
H3 - 32 to 60 inches: sand

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B/D
Ecological site: F111XB403IN - Outwash Upland, F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Wasepi
Percent of map unit: 5 percent
Landform: Drainageways on outwash plains, drainageways on glacial drainage channels, drainageways on deltas, drainageways on lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: R111XB402IN - Dry Outwash Integrade
Hydric soil rating: No

Fox
Percent of map unit: 5 percent
Landform: Knolls on glacial drainage channels, knolls on terraces, knolls on outwash plains, knolls on kames, knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

MfA—Metamora sandy loam, 0 to 4 percent slopes

Map Unit Setting
National map unit symbol: 6ff3
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Metamora and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Metamora

Setting
Landform: Drainageways on till plains, drainageways on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 9 inches: sandy loam
H2 - 9 to 30 inches: sandy loam
H3 - 30 to 37 inches: clay loam
H4 - 37 to 60 inches: loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 4 percent
Landform: Drainageways on glacial drainage channels, drainageways on terraces, drainageways on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Conover

Percent of map unit: 4 percent
Landform: Knolls on moraines, knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Macomb

Percent of map unit: 4 percent
Landform: Drainageways on lake plains, drainageways on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Owosso

Percent of map unit: 3 percent
Landform: Knolls on till plains, knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

MmF—Miami loam, 25 to 35 percent slopes

Map Unit Setting

National map unit symbol: 6ff8
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Miami and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami

Setting

Landform: Escarpments on moraines, escarpments on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Nose slope, head slope, interfluve, base slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 30 inches: clay loam
H3 - 30 to 60 inches: loam

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Fox

Percent of map unit: 5 percent
Landform: Escarpments on kames, escarpments on ice-contact slopes, escarpments on valley trains, escarpments on terraces, escarpments on outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Nose slope, head slope, interfluve, base slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Boyer

Percent of map unit: 5 percent
Landform: Escarpments on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Nose slope, head slope, interfluve, base slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA021MI - Sandy Slopes
Hydric soil rating: No

Kidder

Percent of map unit: 5 percent
Landform: Ridges on ice-contact slopes, ridges on till plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Nose slope, head slope, interfluve, base slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

MoB—Glynwood loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2v4bq
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, nose slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 31 inches: clay
BC - 31 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 28 to 45 inches to densic material
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge

Hydric soil rating: No

Minor Components

Rawson

Percent of map unit: 6 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, nose slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MoC—Morley loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2wp25
Elevation: 570 to 1,120 feet
Mean annual precipitation: 32 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till

Typical profile

Ap - 0 to 9 inches: loam
Bt1 - 9 to 18 inches: clay
Bt2 - 18 to 29 inches: clay
BC - 29 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 26 to 40 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood

Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, nose slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear

Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MoD—Morley loam, 12 to 18 percent slopes

Map Unit Setting

National map unit symbol: 2wp27
Elevation: 570 to 1,000 feet
Mean annual precipitation: 33 to 35 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 155 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till

Typical profile

Ap - 0 to 9 inches: loam
Bt1 - 9 to 18 inches: clay
Bt2 - 18 to 29 inches: clay
BC - 29 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: 26 to 40 inches to densic material
Drainage class: Well drained
Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood

Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, nose slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

OsB—Oshtemo loamy sand, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 6ffk
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Oshtemo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oshtemo

Setting

Landform: Knolls on outwash plains, knolls on glacial drainage channels, knolls on moraines, knolls on beach ridges
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 9 inches: loamy sand
H2 - 9 to 40 inches: loamy sand
H3 - 40 to 60 inches: loamy sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Minor Components

Boyer

Percent of map unit: 3 percent
Landform: Knolls on outwash plains, knolls on kames, knolls on glacial drainage channels, knolls on terraces
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Oakville

Percent of map unit: 3 percent
Landform: Knolls on moraines, knolls on outwash plains, knolls on kames, knolls on lake plains, knolls on beach ridges
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Wasepi

Percent of map unit: 3 percent
Landform: Drainageways on outwash plains, drainageways on glacial drainage channels, drainageways on deltas, drainageways on lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Spinks

Percent of map unit: 3 percent
Landform: Knolls on outwash plains, knolls on glacial drainage channels, knolls on terraces, knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Fox

Percent of map unit: 3 percent
Landform: Knolls on glacial drainage channels, knolls on terraces, knolls on outwash plains, knolls on kames, knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

OwB—Owosso-Miami complex, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 6ffm
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Owosso and similar soils: 50 percent
Miami and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Owosso

Setting

Landform: Knolls on till plains, knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 10 inches: sandy loam
H2 - 10 to 25 inches: sandy loam
H3 - 25 to 60 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Description of Miami

Setting

Landform: Knolls on moraines, knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 30 inches: clay loam
H3 - 30 to 60 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Fox

Percent of map unit: 4 percent
Landform: Knolls on valley trains, knolls on terraces, knolls on outwash plains, knolls on kames, knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Kendallville

Percent of map unit: 4 percent
Landform: Knolls on moraines, knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Boyer

Percent of map unit: 4 percent

Landform: Knolls on outwash plains, knolls on kames, knolls on valley trains, knolls on terraces
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Morley

Percent of map unit: 4 percent
Landform: Knolls on till plains, knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Metamora

Percent of map unit: 4 percent
Landform: Drainageways on till plains, drainageways on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Pa—Palms muck

Map Unit Setting

National map unit symbol: 6ffp
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Palms and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Palms

Setting

Landform: Depressions on till plains, depressions on moraines, depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

Oa1 - 0 to 10 inches: muck
Oa2 - 10 to 30 inches: muck
H3 - 30 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Very high (about 17.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Brookston

Percent of map unit: 3 percent
Landform: Depressions on moraines, depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Adrian

Percent of map unit: 3 percent
Landform: Depressions on lake plains, depressions on outwash plains, depressions on till-floored lake plains, depressions on moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Houghton

Percent of map unit: 3 percent
Landform: Depressions on outwash plains, depressions on till-floored lake plains, depressions on till plains, depressions on moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Edwards

Percent of map unit: 3 percent
Landform: Depressions on outwash plains, depressions on till-floored lake plains, depressions on till plains, depressions on moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Pewamo

Percent of map unit: 3 percent
Landform: Depressions on till-floored lake plains, depressions on till plains, depressions on moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Pe—Pewamo clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t6lz
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 205 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Drainageways on till plains, depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Concave
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 11 inches: clay loam
Btg1 - 11 to 34 inches: clay
Btg2 - 34 to 47 inches: clay loam
BCg - 47 to 57 inches: clay loam

Cg - 57 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 8 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave, linear, convex
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Brookston

Percent of map unit: 4 percent
Landform: Depressions on till plains, drainageways on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Palms, undrained

Percent of map unit: 3 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

Sb—Sebewa loam, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2v4bw
Elevation: 570 to 1,070 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 110 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Sebewa and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sebewa

Setting

Landform: Drainageways, drainageways on stream terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy drift over sandy and gravelly outwash

Typical profile

Ap - 0 to 11 inches: loam
Btg1 - 11 to 21 inches: clay loam
Btg2 - 21 to 33 inches: clay loam
2Cg - 33 to 79 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 23 to 39 inches to strongly contrasting textural stratification
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 45 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 3.0
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: B/D
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Minor Components

Matherton
Percent of map unit: 6 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Gilford
Percent of map unit: 4 percent
Landform: Drainageways, drainageways on stream terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

So—Sloan silt loam, 0 to 1 percent slopes, frequently flooded

Map Unit Setting
National map unit symbol: 2ydd3
Elevation: 520 to 1,340 feet
Mean annual precipitation: 31 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition
Sloan, frequently flooded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sloan, Frequently Flooded

Setting
Landform: Depressions on flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy alluvium

Typical profile

Ap - 0 to 12 inches: silt loam
Bg - 12 to 42 inches: silty clay loam
Cg - 42 to 79 inches: stratified gravelly sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: Occasional
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

Minor Components

Shoals

Percent of map unit: 6 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA003MI - Moist Floodplains
Hydric soil rating: No

Sloan, frequently flooded, long duration

Percent of map unit: 4 percent
Landform: Depressions on flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

SpB—Spinks loamy sand, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 6fg2
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Spinks and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Spinks

Setting

Landform: Knolls on strand plains, knolls on valley trains, knolls on terraces, knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 10 inches: loamy sand
H2 - 10 to 22 inches: loamy sand
H3 - 22 to 85 inches: fine sand
H4 - 85 to 90 inches: fine sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Minor Components

Oshtemo

Percent of map unit: 3 percent
Landform: Knolls on strand plains, knolls on valley trains, knolls on moraines, knolls on beach ridges
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Boyer

Percent of map unit: 3 percent
Landform: Knolls on strand plains, knolls on kames, knolls on valley trains, knolls on terraces
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Seward

Percent of map unit: 3 percent
Landform: Knolls on lake plains, knolls on till plains, knolls on ground moraines, knolls on strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Oakville

Percent of map unit: 3 percent
Landform: Knolls on moraines, knolls on strand plains, knolls on kames, knolls on lake plains, knolls on beach ridges
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Thetford

Percent of map unit: 3 percent
Landform: Drainageways on moraines, drainageways on till plains, drainageways on lake plains, drainageways on strand plains, drainageways on beach ridges
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

SpC—Spinks loamy sand, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 6fg3
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Spinks and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Spinks

Setting

Landform: Hills on moraines, hills on ice-contact slopes, hills on valley trains, hills on outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 10 inches: loamy sand
H2 - 10 to 22 inches: loamy sand
H3 - 22 to 85 inches: fine sand
H4 - 85 to 90 inches: fine sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A

Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Minor Components

Seward

Percent of map unit: 3 percent
Landform: Hills on ice-contact slopes, hills on ground moraines, hills on till plains, hills on lake plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA019MI - Moist Sandy Drift Plains
Hydric soil rating: No

Oakville

Percent of map unit: 3 percent
Landform: Knolls on beach ridges, knolls on lake plains, knolls on kames, knolls on outwash plains, knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Oshtemo

Percent of map unit: 3 percent
Landform: Hills on beach ridges, hills on ice-contact slopes, hills on valley trains, hills on outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Thetford

Percent of map unit: 3 percent
Landform: Drainageways on ice-contact slopes, drainageways on till plains, drainageways on lake plains, drainageways on outwash plains, drainageways on beach ridges
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA019MI - Moist Sandy Drift Plains
Hydric soil rating: No

Boyer

Percent of map unit: 3 percent
Landform: Hills on ice-contact slopes, hills on valley trains, hills on kames, hills on outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

SpD—Spinks loamy sand, 12 to 18 percent slopes

Map Unit Setting

National map unit symbol: 6fg4
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Spinks and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Spinks

Setting

Landform: Ridges on ice-contact slopes, ridges on terraces, ridges on valley trains, ridges on outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Linear, convex
Across-slope shape: Convex, concave
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 10 inches: loamy sand
H2 - 10 to 22 inches: loamy sand
H3 - 22 to 85 inches: fine sand
H4 - 85 to 90 inches: fine sand

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: F098XA021MI - Sandy Slopes
Hydric soil rating: No

Minor Components

Oakville

Percent of map unit: 3 percent
Landform: Knolls on beach ridges, knolls on lake plains, knolls on kames, knolls on outwash plains, knolls on ice-contact slopes
Landform position (two-dimensional): Backslope, footslope, summit, shoulder, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Linear, convex
Across-slope shape: Convex, concave
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Oshtemo

Percent of map unit: 3 percent
Landform: Hills on beach ridges, hills on ice-contact slopes, hills on valley trains, hills on outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Linear, convex
Across-slope shape: Convex, concave
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Boyer

Percent of map unit: 3 percent
Landform: Ridges on terraces, ridges on valley trains, ridges on kames, ridges on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Linear, convex
Across-slope shape: Convex, concave
Ecological site: F098XA021MI - Sandy Slopes
Hydric soil rating: No

Miami

Percent of map unit: 2 percent
Landform: Ridges on moraines, ridges on till plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Linear, convex
Across-slope shape: Convex, concave
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Thetford

Percent of map unit: 2 percent
Landform: Drainageways on ice-contact slopes, drainageways on till plains, drainageways on lake plains, drainageways on outwash plains, drainageways on beach ridges
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA019MI - Moist Sandy Drift Plains
Hydric soil rating: No

Kidder

Percent of map unit: 2 percent
Landform: Ridges on moraines, ridges on till plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Linear, convex
Across-slope shape: Convex, concave
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

SpE—Spinks loamy sand, 18 to 25 percent slopes

Map Unit Setting

National map unit symbol: 6fg5
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Spinks and similar soils: 85 percent
Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Spinks

Setting

Landform: Escarpments on ice-contact slopes, escarpments on terraces, escarpments on valley trains, escarpments on outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Linear, convex
Across-slope shape: Convex, concave
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 10 inches: loamy sand
H2 - 10 to 22 inches: loamy sand
H3 - 22 to 85 inches: fine sand
H4 - 85 to 90 inches: fine sand

Properties and qualities

Slope: 18 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: F098XA021MI - Sandy Slopes
Hydric soil rating: No

Minor Components

Oakville

Percent of map unit: 3 percent
Landform: Knolls on beach ridges, knolls on lake plains, knolls on kames, knolls on outwash plains, knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Linear, convex
Across-slope shape: Convex, concave
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Miami

Percent of map unit: 3 percent

Landform: Escarpments on moraines, escarpments on till plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Side slope, nose slope, head slope, interfluve, crest, base slope
Down-slope shape: Linear, convex
Across-slope shape: Convex, concave
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Boyer

Percent of map unit: 3 percent
Landform: Escarpments on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Linear, convex
Across-slope shape: Convex, concave
Ecological site: F098XA021MI - Sandy Slopes
Hydric soil rating: No

Kidder

Percent of map unit: 3 percent
Landform: Ridges on moraines, ridges on till plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Linear, convex
Across-slope shape: Convex, concave
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Oshtemo

Percent of map unit: 3 percent
Landform: Hills on beach ridges, hills on ice-contact slopes, hills on valley trains, hills on outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, head slope, interfluve
Down-slope shape: Linear, convex
Across-slope shape: Convex, concave
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

W—Water

Map Unit Setting

National map unit symbol: 6fgf
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

WawabB—Wawasee loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2wp1x
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 9 inches: loam
Bt1 - 9 to 24 inches: loam
Bt2 - 24 to 33 inches: clay loam
C - 33 to 79 inches: loam

Properties and qualities

Slope: 2 to 6 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear, concave
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawabC—Wawasee loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2wvgl
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 24 inches: loam
Bt2 - 24 to 33 inches: clay loam
C - 33 to 79 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent

Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear, concave
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawabD—Wawasee loam, 12 to 18 percent slopes

Map Unit Setting

National map unit symbol: 2wvgn
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wawasee and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 24 inches: loam
Bt2 - 24 to 32 inches: clay loam
C - 32 to 79 inches: loam

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 6 percent
Landform: Moraines
Landform position (two-dimensional): Footslope, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 4 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear, concave
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawabE—Wawasee loam, 18 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2wvgs
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines

Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

A - 0 to 8 inches: loam
Bt1 - 8 to 24 inches: loam
Bt2 - 24 to 32 inches: clay loam
C - 32 to 79 inches: loam

Properties and qualities

Slope: 18 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Footslope, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Fox

Percent of map unit: 6 percent
Landform: Outwash terraces, outwash plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest, tread
Down-slope shape: Convex
Across-slope shape: Linear, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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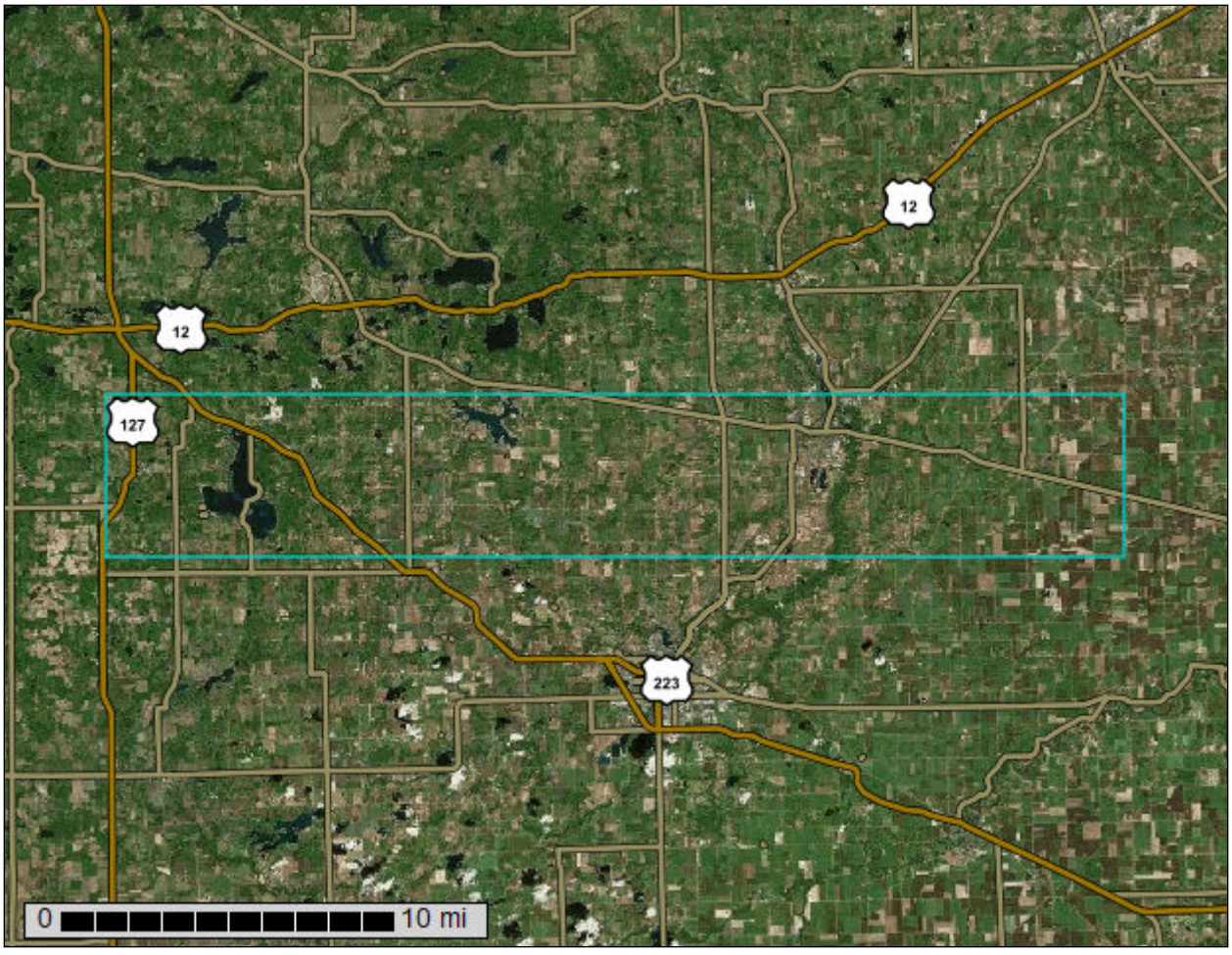
Custom Soil Resource Report for Hillsdale County, Michigan, Lenawee County, Michigan, and Monroe County, Michigan



June 13, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

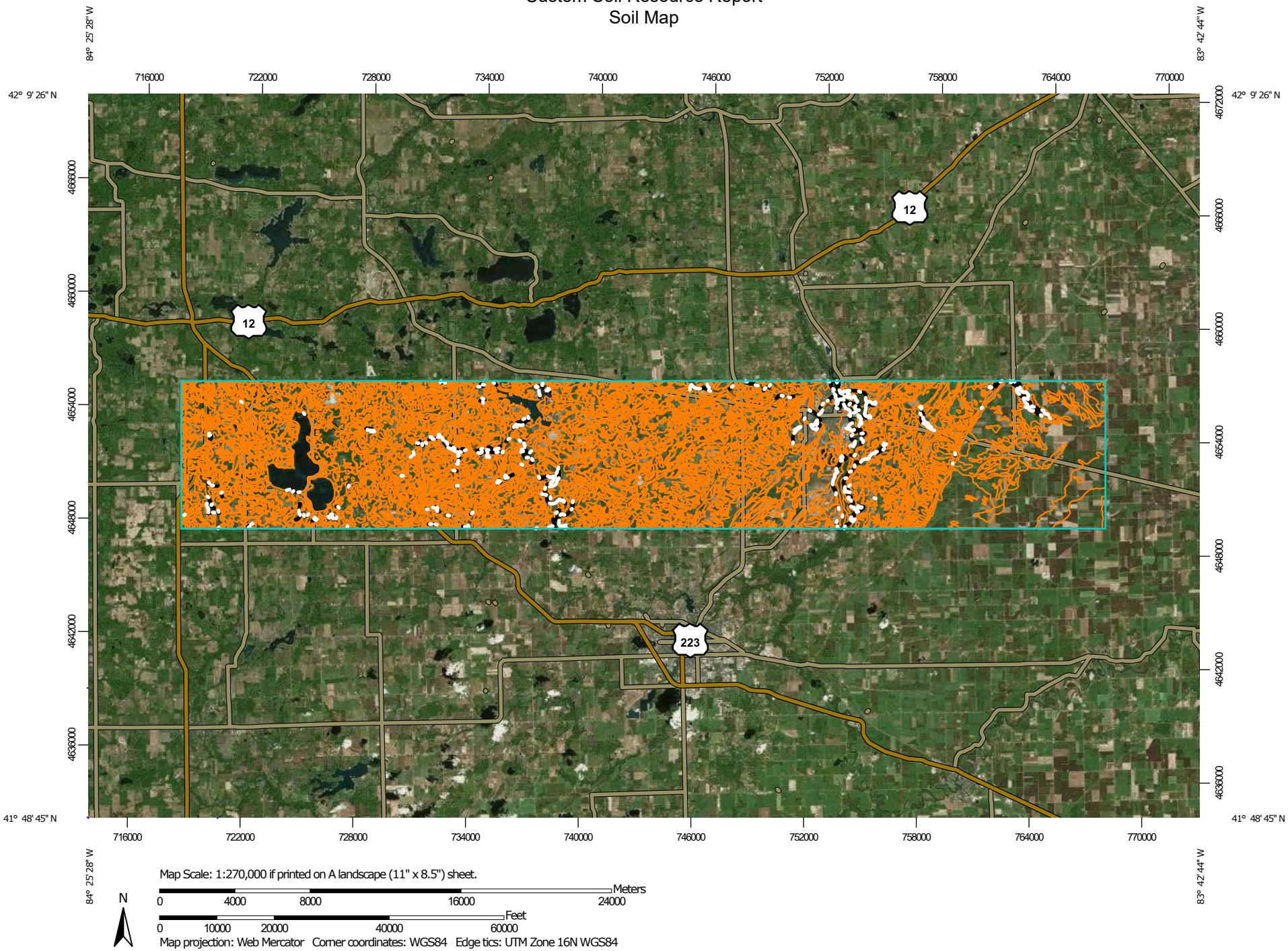
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:15,800 to 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hillsdale County, Michigan
Survey Area Data: Version 22, Aug 27, 2024

Soil Survey Area: Lenawee County, Michigan
Survey Area Data: Version 20, Aug 27, 2024

Soil Survey Area: Monroe County, Michigan
Survey Area Data: Version 22, Aug 27, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

MAP LEGEND

MAP INFORMATION

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
12B	Williamstown-Conover complex, 1 to 6 percent slopes	128.0	0.1%
12C2	Wawasee loam, 6 to 12 percent slopes, eroded	118.5	0.1%
12D2	Wawasee clay loam, 12 to 18 percent slopes, eroded	9.8	0.0%
13B	Conover loam, 1 to 4 percent slopes	33.8	0.0%
14	Wolcott silt loam	35.6	0.0%
15B	Boyer loamy sand, 1 to 6 percent slopes	1.4	0.0%
16B	Fox sandy loam, till plain, 2 to 6 percent slopes	5.8	0.0%
16D2	Fox gravelly sandy loam, 12 to 18 percent slopes, eroded	12.0	0.0%
18B	Glynwood-Blount complex, 1 to 6 percent slopes	14.1	0.0%
18C2	Morley loam, 6 to 12 percent slopes, eroded	11.3	0.0%
19B	Blount loam, 0 to 4 percent slopes	11.9	0.0%
20	Pewamo silt loam	26.3	0.0%
32	Sloan silt loam, 0 to 1 percent slopes, frequently flooded	26.3	0.0%
46	Wallkill silt loam	3.9	0.0%
50C	Coloma sand, 6 to 18 percent slopes	0.5	0.0%
HgtahA	Houghton muck, 0 to 1 percent slopes	5.2	0.0%
Subtotals for Soil Survey Area		**444.4**	**0.5%**
Totals for Area of Interest		**95,140.9**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BaA	Barry sandy loam, overwashed, 0 to 3 percent slopes	215.2	0.2%
BbA	Berrien loamy sand, 0 to 3 percent slopes	1.6	0.0%
BbB	Berrien loamy sand, 3 to 7 percent slopes	2.1	0.0%
BbB2	Berrien loamy sand, 3 to 7 percent slopes, moderately eroded	3.9	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BcA	Berrien sandy loam, 0 to 3 percent slopes	39.2	0.0%
BcB	Berrien sandy loam, 3 to 7 percent slopes	282.4	0.3%
BcB2	Berrien sandy loam, 3 to 7 percent slopes, moderately eroded	7.2	0.0%
BcC	Berrien sandy loam, 7 to 15 percent slopes	31.5	0.0%
BdA	Berville loam, 0 to 3 percent slopes	2.2	0.0%
BgA	Blount loam and Pewamo clay loam, 0 to 3 percent slopes	170.6	0.2%
BhA	Brady sandy loam, 0 to 3 percent slopes	77.0	0.1%
BkA	Brady and Macomb loams, 0 to 3 percent slopes	1,036.3	1.1%
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	46.7	0.0%
BnA	Bronson sandy loam, 0 to 3 percent slopes	169.6	0.2%
BnB	Bronson sandy loam, 3 to 7 percent slopes	292.8	0.3%
BntaaA	Blount loam, 0 to 2 percent slopes	3,302.7	3.5%
BntaaB	Blount loam, 2 to 6 percent slopes	6,793.4	7.1%
BntabB	Blount loam, 2 to 6 percent slopes, eroded	595.2	0.6%
BoA	Brookston loam, 0 to 3 percent slopes	629.7	0.7%
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	929.2	1.0%
CaB	Cadmus loam, 3 to 7 percent slopes	1,658.6	1.7%
CaB2	Cadmus loam, 3 to 7 percent slopes, moderately eroded	6.7	0.0%
CarabA	Carlisle muck, 0 to 2 percent slopes	727.6	0.8%
CaracA	Carlisle muck, disintegration moraine, 0 to 2 percent slopes	1,051.3	1.1%
CbA	Cadmus sandy loam, 0 to 3 percent slopes	291.7	0.3%
CbB	Cadmus sandy loam, 3 to 7 percent slopes	461.1	0.5%
CcA	Cadmus and Blount loams, 0 to 3 percent slopes	1,170.0	1.2%
CeA	Colwood very fine sandy loam, 0 to 3 percent slopes	877.9	0.9%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	160.4	0.2%
CgA	Conover loam, 0 to 3 percent slopes	1,548.4	1.6%
CgB	Conover loam, 3 to 7 percent slopes	491.7	0.5%
CgB2	Conover loam, 3 to 7 percent slopes, moderately eroded	6.8	0.0%
Cp	Clay pit	4.9	0.0%
EaA	Edwards muck, 0 to 3 percent slopes	509.1	0.5%
FaA	Fox cobbly gravelly loam, 0 to 3 percent slopes	1,336.7	1.4%
FaB	Fox cobbly gravelly loam, 3 to 7 percent slopes	73.5	0.1%
FaC2	Fox cobbly gravelly loam, 7 to 15 percent slopes, moderately eroded	34.4	0.0%
FbA	Fox loam, 0 to 3 percent slopes	954.2	1.0%
FbB	Fox loam, 3 to 7 percent slopes	289.7	0.3%
FbC	Fox loam, 7 to 15 percent slopes	37.1	0.0%
FbC2	Fox loam, 7 to 15 percent slopes, moderately eroded	53.2	0.1%
FcA	Fox sandy loam, till plain, 0 to 2 percent slopes	675.4	0.7%
FcB	Fox sandy loam, till plain, 2 to 6 percent slopes	921.7	1.0%
FcB2	Fox sandy loam, 3 to 7 percent slopes, moderately eroded	4.2	0.0%
FcC	Fox sandy loam, Huron Lobe, 6 to 12 percent slopes	125.6	0.1%
FcC2	Fox sandy loam, Huron Lobe, 6 to 12 percent slopes, eroded	199.7	0.2%
FcD	Fox sandy loam, Huron Lobe, 12 to 25 percent slopes	264.3	0.3%
FcD2	Fox sandy loam, 12 to 25 percent slopes, moderately eroded	159.5	0.2%
GaA	Genesee loam, 0 to 2 percent slopes, occasionally flooded	6.7	0.0%
GbA	Genesee sandy loam, 0 to 3 percent slopes	10.2	0.0%
GcA	Genesee and Eel loams, 0 to 3 percent slopes	114.5	0.1%
GeA	Granby sandy loam, 0 to 3 percent slopes	39.6	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	1,082.1	1.1%
GgA	Griffin and Sloan loams, 0 to 3 percent slopes	85.3	0.1%
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	1,499.7	1.6%
Gp	Gravel pits	519.4	0.5%
HaB	Hillsdale sandy loam, 3 to 7 percent slopes	0.8	0.0%
HcA	Hoytville clay loam and silty clay loam, 0 to 3 percent slopes	38.4	0.0%
HeA	Hoytville clay loam and Rimer sandy loam, 0 to 3 percent slopes	1.2	0.0%
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	1,599.4	1.7%
HgtahA	Houghton muck, 0 to 1 percent slopes	1,427.7	1.5%
HgtaiA	Houghton muck, Erie-Huron lake plain, 0 to 1 percent slopes	70.7	0.1%
HgtanA	Houghton muck, disintegration moraine, 0 to 2 percent slopes	247.4	0.3%
IaA	Ionia loam, 0 to 3 percent slopes	16.7	0.0%
IaB	Ionia loam, 3 to 7 percent slopes	340.2	0.4%
KaC	Kendallville loam, 7 to 15 percent slopes	71.4	0.1%
KaC2	Kendallville loam, 7 to 15 percent slopes, moderately eroded	95.3	0.1%
KbC	Kendallville sandy loam, 7 to 15 percent slopes	50.0	0.1%
KcC2	Kendallville soils, 7 to 15 percent slopes, moderately or severely eroded	2.8	0.0%
KdA	Kerston muck and loams, 0 to 3 percent slopes	362.3	0.4%
KeA	Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes	59.2	0.1%
KfA	Kokomo and Barry loams, 0 to 3 percent slopes	2,061.1	2.2%
KgA	Kokomo, Barry, and Wallkill loams, overwashed, 0 to 3 percent slopes	1,269.6	1.3%
LaA	Lake borders	55.6	0.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
LcA	Linwood muck, 0 to 3 percent slopes	99.2	0.1%
Le	Lenawee silty clay loam, 0 to 1 percent slopes	882.8	0.9%
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	137.3	0.1%
MbA	Macomb sandy clay loam and Hoytville clay loam, 0 to 3 percent slopes	9.1	0.0%
McA	Maumee loamy sand, 0 to 3 percent slopes	67.6	0.1%
MdA	Miami loam, 0 to 3 percent slopes	42.0	0.0%
MeD	Miami loam and Boyer sandy loam, 12 to 25 percent slopes	1,564.5	1.6%
MeD2	Miami loam and Boyer sandy loam, 12 to 25 percent slopes, moderately eroded	851.6	0.9%
MeE	Miami loam and Boyer sandy loam, 25+ percent slopes	22.0	0.0%
MfD3	Miami soils, 15 to 25 percent slopes, severely eroded	44.3	0.0%
MgD3	Miami and Boyer soils, 12 to 25 percent slopes, severely eroded	41.1	0.0%
MgE2	Miami and Boyer soils, 25+ percent slopes, moderately eroded	11.6	0.0%
MhA	Morley loam, 0 to 3 percent slopes	84.4	0.1%
MhB	Glynwood loam, 2 to 6 percent slopes	1,842.5	1.9%
MhB2	Glynwood loam, 2 to 6 percent slopes, eroded	6,724.8	7.1%
MhC	Morley loam, 6 to 12 percent slopes	257.5	0.3%
MhC2	Morley loam, 6 to 12 percent slopes, eroded	3,789.4	4.0%
MhD	Morley loam, 12 to 25 percent slopes	31.9	0.0%
MhD2	Morley loam, 12 to 25 percent slopes, moderately eroded	215.6	0.2%
MhE	Morley loam, 25+ percent slopes	20.7	0.0%
MkC3	Morley soils, 7 to 15 percent slopes, severely eroded	320.6	0.3%
MkD3	Morley clay loam, 12 to 18 percent slopes, severely eroded	141.5	0.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
NaA	Nappanee silt loam, 0 to 3 percent slopes	1,652.9	1.7%
NaB	Nappanee silt loam, 3 to 7 percent slopes	48.3	0.1%
NbB	Nappanee loam, 3 to 7 percent slopes	137.2	0.1%
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	869.5	0.9%
OaA	Ogden muck, 0 to 3 percent slopes	184.8	0.2%
ObA	Oshtemo loamy sand, 0 to 3 percent slopes	53.5	0.1%
ObB	Oshtemo loamy sand, 3 to 7 percent slopes	374.2	0.4%
PaA	Palms muck, 0 to 3 percent slopes	88.3	0.1%
PbA	Pewamo clay loam, 0 to 2 percent slopes	6,548.8	6.9%
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	594.7	0.6%
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	225.0	0.2%
PdB	Plainfield and Berrien loamy sands, 3 to 7 percent slopes	46.6	0.0%
PeA	Plainfield and Ottawa loamy sands, 0 to 3 percent slopes	5.7	0.0%
PeB	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes	324.3	0.3%
PeC	Plainfield and Ottawa loamy sands, 7 to 15 percent slopes	264.2	0.3%
PeC2	Plainfield and Ottawa loamy sands, 7 to 15 percent slopes, moderately eroded	0.1	0.0%
PwmaaA	Pewamo clay loam, dense substratum, 0 to 1 percent slopes	1,044.0	1.1%
RaA	Rifle peat, 0 to 3 percent slopes	27.5	0.0%
RbA	Rollin muck, 0 to 3 percent slopes	73.8	0.1%
SbA	Sebewa sandy loam, 0 to 3 percent slopes	171.3	0.2%
ScB	Spinks, Boyer, Plainfield, and Hillsdale soils, 3 to 7 percent slopes	168.2	0.2%
ScB2	Spinks, Boyer, Plainfield, and Hillsdale soils, 3 to 7 percent slopes, moderately eroded	6.9	0.0%
ScC	Spinks, Boyer, Plainfield, and Hillsdale soils, 7 to 15 percent slopes	78.0	0.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
ScC2	Spinks, Boyer, Plainfield, and Hillsdale soils, 7 to 15 percent slopes, moderately eroded	242.0	0.3%
ScD2	Spinks, Boyer, Plainfield, and Hillsdale soils, 12 to 25 percent slopes, moderately eroded	37.0	0.0%
SdC2	St. Clair loam, 7 to 15 percent slopes, moderately eroded	119.6	0.1%
SdD2	St. Clair loam, 12 to 25 percent slopes, moderately eroded	19.3	0.0%
Sf	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	154.5	0.2%
Sg	Sewage lagoons	48.5	0.1%
TaA	Tawas muck, 0 to 3 percent slopes	15.5	0.0%
Ud	Udorthents, nearly level and undulating	10.9	0.0%
W	Water	3,010.6	3.2%
WaA	Wallkill loam, overwashed, 0 to 3 percent slopes	123.8	0.1%
WawaaC	Wawasee clay loam, 6 to 12 percent slopes, severely eroded	26.0	0.0%
WawabB	Wawasee loam, 2 to 6 percent slopes	3,072.8	3.2%
WawabC	Wawasee loam, 6 to 12 percent slopes	3,129.0	3.3%
WawacB	Wawasee loam, 2 to 6 percent slopes, eroded	1,506.5	1.6%
WawacC	Wawasee loam, 6 to 12 percent slopes, eroded	2,650.7	2.8%
WawadD	Wawasee loam, 12 to 25 percent slopes, eroded	283.5	0.3%
WbA	Warners muck and marl, 0 to 3 percent slopes	113.2	0.1%
WcA	Wauseon loam, 0 to 3 percent slopes	743.0	0.8%
WdA	Willette muck, 0 to 3 percent slopes	225.8	0.2%
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	8,775.9	9.2%
Subtotals for Soil Survey Area		**94,350.0**	**99.2%**
Totals for Area of Interest		**95,140.9**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
43A	Nappanee loam, 0 to 3 percent slopes	1.6	0.0%
114A	Nappanee silt loam, 0 to 3 percent slopes	0.3	0.0%
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	3.8	0.0%
Subtotals for Soil Survey Area		**5.7**	**0.0%**
Totals for Area of Interest		**95,140.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Hillsdale County, Michigan

12B—Williamstown-Conover complex, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 6b8c
Elevation: 580 to 1,200 feet
Mean annual precipitation: 30 to 45 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Williamstown and similar soils: 62 percent
Conover and similar soils: 32 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Williamstown

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 33 inches: clay loam
H3 - 33 to 60 inches: loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 18 to 39 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Description of Conover

Setting

Landform: Knolls on ground moraines

Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 27 inches: clay loam
H3 - 27 to 60 inches: loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Steamburg

Percent of map unit: 3 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Wolcott

Percent of map unit: 3 percent
Landform: Ground moraines, depressions
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

12C2—Wawasee loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvgm
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 7 inches: loam
Bt1 - 7 to 23 inches: loam
Bt2 - 23 to 31 inches: clay loam
C - 31 to 79 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B

Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier
Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston
Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

12D2—Wawasee clay loam, 12 to 18 percent slopes, eroded

Map Unit Setting
National map unit symbol: 2wvgy
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition
Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 7 inches: clay loam
Bt1 - 7 to 23 inches: loam
Bt2 - 23 to 31 inches: clay loam
C - 31 to 79 inches: loam

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

13B—Conover loam, 1 to 4 percent slopes

Map Unit Setting

National map unit symbol: 6b8h
Elevation: 580 to 1,000 feet
Mean annual precipitation: 30 to 45 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 27 inches: clay loam
H3 - 27 to 60 inches: loam

Properties and qualities

Slope: 1 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Williamstown

Percent of map unit: 4 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Wolcott

Percent of map unit: 4 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Sloan

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

14—Wolcott silt loam

Map Unit Setting

National map unit symbol: 6b8j
Elevation: 580 to 1,000 feet
Mean annual precipitation: 28 to 45 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Wolcott and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wolcott

Setting

Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear

Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 20 inches: silt loam
H2 - 20 to 38 inches: clay loam
H3 - 38 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 11.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Minor Components

Conover

Percent of map unit: 1 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sloan

Percent of map unit: 1 percent
Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

Houghton

Percent of map unit: 1 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

15B—Boyer loamy sand, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2t6l4
Elevation: 700 to 1,250 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Boyer and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boyer

Setting

Landform: Moraines, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Head slope, tread
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy outwash and/or sandy outwash over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: loamy sand
E - 9 to 17 inches: loamy sand
Bt - 17 to 30 inches: sandy loam
2C - 30 to 79 inches: stratified coarse sand to gravelly sand to very gravelly sand

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: A
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Minor Components

Oshtemo
Percent of map unit: 9 percent
Landform: Stream terraces, moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, tread
Down-slope shape: Linear
Across-slope shape: Convex, linear
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Bronson
Percent of map unit: 6 percent
Landform: Moraines, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

16B—Fox sandy loam, till plain, 2 to 6 percent slopes

Map Unit Setting
National map unit symbol: 2wvh5
Elevation: 650 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting
Landform: Outwash plains, outwash terraces
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest, tread
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loamy glaciofluvial deposits over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified sand to gravel

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

16D2—Fox gravelly sandy loam, 12 to 18 percent slopes, eroded

Map Unit Setting

National map unit symbol: 6b8r
Elevation: 580 to 1,300 feet
Mean annual precipitation: 30 to 42 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Fox and similar soils: 87 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: gravelly sandy loam
H2 - 8 to 34 inches: gravelly sandy clay loam
H3 - 34 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes

Hydric soil rating: No

Minor Components

Hillsdale

Percent of map unit: 6 percent
Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Riddles

Percent of map unit: 6 percent
Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Sebewa

Percent of map unit: 1 percent
Landform: Drainageways on ice-contact slopes
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

18B—Glynwood-Blount complex, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 6b8v
Elevation: 580 to 1,530 feet
Mean annual precipitation: 29 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Glynwood and similar soils: 57 percent

Blount and similar soils: 37 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 26 inches: clay loam
H3 - 26 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Description of Blount

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 32 inches: silty clay loam
H3 - 32 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 3 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Steamburg

Percent of map unit: 3 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

18C2—Morley loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wp26
Elevation: 750 to 1,220 feet
Mean annual precipitation: 32 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 165 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 17 inches: clay
Bt2 - 17 to 28 inches: clay
BC - 28 to 33 inches: clay loam
Cd - 33 to 79 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 24 to 38 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood

Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear

Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

19B—Blount loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 2ydcv
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, concave
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 30 inches: silty clay
BC - 30 to 37 inches: clay loam
Cd - 37 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: 26 to 48 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Glynwood

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 6 percent
Landform: Depressions, ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Conover

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Badaxe

Percent of map unit: 2 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

20—Pewamo silt loam

Map Unit Setting

National map unit symbol: 6b90
Elevation: 580 to 1,530 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 11 inches: silt loam
H2 - 11 to 48 inches: clay loam
H3 - 48 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Minor Components

Houghton

Percent of map unit: 1 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Blount

Percent of map unit: 1 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Glynwood

Percent of map unit: 1 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

32—Sloan silt loam, 0 to 1 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2ydd3
Elevation: 520 to 1,340 feet
Mean annual precipitation: 31 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 200 days
Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Sloan, frequently flooded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sloan, Frequently Flooded

Setting

Landform: Depressions on flood plains
Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy alluvium

Typical profile

Ap - 0 to 12 inches: silt loam
Bg - 12 to 42 inches: silty clay loam
Cg - 42 to 79 inches: stratified gravelly sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: Occasional
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

Minor Components

Shoals

Percent of map unit: 6 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA003MI - Moist Floodplains
Hydric soil rating: No

Sloan, frequently flooded, long duration

Percent of map unit: 4 percent
Landform: Depressions on flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

46—Wallkill silt loam

Map Unit Setting

National map unit symbol: 6b9t
Elevation: 580 to 1,400 feet
Mean annual precipitation: 28 to 45 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wallkill and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wallkill

Setting

Landform: Depressions on moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over organic material

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 34 inches: silt loam
Oa - 34 to 60 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Occasional
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 16.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

Minor Components

Wolcott

Percent of map unit: 1 percent
Landform: Depressions on moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Houghton

Percent of map unit: 1 percent
Landform: Depressions on moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Pewamo

Percent of map unit: 1 percent
Landform: Depressions on moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

50C—Coloma sand, 6 to 18 percent slopes

Map Unit Setting

National map unit symbol: 6b9w
Elevation: 580 to 1,360 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Coloma and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Coloma

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, backslope, footslope, toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: sand
H2 - 9 to 35 inches: sand
H3 - 35 to 60 inches: stratified sand to sandy loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Minor Components

Thetford

Percent of map unit: 3 percent
Landform: Moraines on swales
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA019MI - Moist Sandy Drift Plains
Hydric soil rating: No

Morley

Percent of map unit: 2 percent
Landform: Moraines
Landform position (two-dimensional): Summit, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Miami

Percent of map unit: 2 percent
Landform: Moraines
Landform position (two-dimensional): Summit, backslope, footslope, toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

HgtahA—Houghton muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2zdlc
Elevation: 720 to 1,100 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Houghton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton

Setting

Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 80 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 3 percent
Maximum salinity: Nonsaline to very slightly saline (0.4 to 2.7 mmhos/cm)

Sodium adsorption ratio, maximum: 0.8
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R098XA002MI - Inland Salt Marshes, F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Adrian

Percent of map unit: 4 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Edwards

Percent of map unit: 3 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Palms

Percent of map unit: 2 percent
Landform: Depressions on moraines, swamps on moraines, drainageways on till plains, drainageways on moraines, drainageways on outwash plains, depressions on outwash plains, depressions on till plains, swamps on outwash plains, swamps on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Gilford, gravelly subsoil

Percent of map unit: 1 percent
Landform: Glacial drainage channels, glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA020MI - Wet Sandy Drift Depressions
Hydric soil rating: Yes

Lenawee County, Michigan

BaA—Barry sandy loam, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b28
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Barry and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Barry

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: sandy loam
H2 - 12 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BbA—Berrien loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b29
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BbB—Berrien loamy sand, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2b
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BbB2—Berrien loamy sand, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b2c
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien, Moderately Eroded

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BcA—Berrien sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2d
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

BcB—Berrien sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2f
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

BcB2—Berrien sandy loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b2g
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien, Moderately Eroded

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BcC—Berrien sandy loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b2h
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BdA—Berville loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2j
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Berville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berville

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 24 inches: sandy loam
H3 - 24 to 36 inches: loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BgA—Blount loam and Pewamo clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2q
Elevation: 580 to 1,530 feet
Mean annual precipitation: 29 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 60 percent
Pewamo and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 10 inches: silty clay loam
H3 - 10 to 26 inches: silty clay loam
H4 - 26 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Description of Pewamo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 16 inches: clay loam
H2 - 16 to 32 inches: silty clay loam
H3 - 32 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BhA—Brady sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2r
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Knolls on strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 5 percent
Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BkA—Brady and Macomb loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2s
Elevation: 600 to 1,200 feet

Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 46 percent
Macomb and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Macomb

Setting

Landform: Knolls on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 32 inches: loam

H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 10 percent
Landform: Strand plains, depressions
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BmA—Brady and Macomb sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2t
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 46 percent
Macomb and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Macomb

Setting

Landform: Knolls on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 32 inches: loam
H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BnA—Bronson sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2v
Elevation: 500 to 1,200 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Bronson and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bronson

Setting

Landform: Knolls on strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 38 inches: sandy loam
H3 - 38 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Brookston

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BnB—Bronson sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2w
Elevation: 500 to 1,200 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Bronson and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bronson

Setting

Landform: Knolls on strand plains

Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 38 inches: sandy loam
H3 - 38 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Brookston

Percent of map unit: 5 percent
Landform: Depressions on moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BntaaA—Blount loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wp2k
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, concave
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 30 inches: silty clay
BC - 30 to 37 inches: clay loam
Cd - 37 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 28 to 48 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 6 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Conover

Percent of map unit: 4 percent

Landform: End moraines, ground moraines
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Glynwood

Percent of map unit: 3 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Badaxe

Percent of map unit: 2 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

BntaaB—Blount loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2wp2l
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: End moraines, ground moraines
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 28 inches: silty clay
BC - 28 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 26 to 45 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Glynwood, eroded

Percent of map unit: 8 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Conover

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Depressions on end moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear

Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Badaxe

Percent of map unit: 2 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, convex
Across-slope shape: Linear
Hydric soil rating: No

BntabB—Blount loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wp2m
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount, eroded, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount, Eroded

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 7 inches: loam
Bt - 7 to 24 inches: silty clay
BC - 24 to 30 inches: clay loam
Cd - 30 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 24 to 40 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)

Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Glynwood, eroded

Percent of map unit: 8 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Conover

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Depressions, end moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Badaxe

Percent of map unit: 2 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, convex
Across-slope shape: Linear
Hydric soil rating: No

BoA—Brookston loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2x
Elevation: 500 to 1,020 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Brookston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brookston

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 23 inches: clay loam
H3 - 23 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BpA—Brookston loam, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2y
Elevation: 600 to 900 feet
Mean annual precipitation: 35 to 40 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 150 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Brookston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brookston

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 18 inches: clay loam
H3 - 18 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 11.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

CaB—Cadmus loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2z
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CaB2—Cadmus loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b30
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CarabA—Carlisle muck, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2zdk5
Elevation: 740 to 990 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Carlisle and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carlisle

Setting

Landform: Depressions on moraines, depressions on glacial drainage channels, depressions on outwash plains, depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Woody organic material

Typical profile

Oa1 - 0 to 13 inches: muck
Oa2 - 13 to 37 inches: muck
Oa3 - 37 to 80 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 0.6
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Linwood

Percent of map unit: 4 percent
Landform: Depressions on moraines, depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Wallkill

Percent of map unit: 4 percent
Landform: Depressions on glacial drainage channels, depressions on moraines, depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Adrian

Percent of map unit: 2 percent
Landform: Depressions on moraines, drainageways on moraines, drainageways on glacial drainage channels, drainageways on outwash plains, depressions on outwash plains, depressions on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

CaracA—Carlisle muck, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2zdl1
Elevation: 700 to 850 feet
Mean annual precipitation: 35 to 41 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Carlisle and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carlisle

Setting

Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material and/or woody organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 79 inches: woody muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very high (about 24.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Minor Components

Linwood

Percent of map unit: 9 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

Pewamo

Percent of map unit: 6 percent
Landform: Depressions on moraines, drainageways on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression

Hydric soil rating: Yes

CbA—Cadmus sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b31
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

CbB—Cadmus sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b32
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CcA—Cadmus and Blount loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b34
Elevation: 580 to 1,530 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Cadmus and similar soils: 46 percent
Blount and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Description of Blount

Setting

Landform: Knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 10 inches: silty clay loam
H3 - 10 to 26 inches: silty clay loam
H4 - 26 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 10 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

CeA—Colwood very fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b36
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Colwood and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: very fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

CfA—Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b37
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Colwood and similar soils: 51 percent
Wauseon and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Wauseon

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

CgA—Conover loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b38
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Colwood

Percent of map unit: 5 percent
Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

CgB—Conover loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b39
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches

Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Colwood

Percent of map unit: 5 percent
Landform: Knolls on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

CgB2—Conover loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b3b
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover, Moderately Eroded

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Colwood

Percent of map unit: 5 percent
Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

Cp—Clay pit

Map Unit Composition

Clay pit: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

EaA—Edwards muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b3c
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Edwards and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Edwards

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over marl

Typical profile

Oa - 0 to 24 inches: muck
Lma - 24 to 60 inches: marly material

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained

Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 90 percent
Available water supply, 0 to 60 inches: Very high (about 14.3 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: R111XB002IN - Limnic Muck
Hydric soil rating: Yes

FaA—Fox cobbly gravelly loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b3d
Elevation: 800 to 1,000 feet
Mean annual precipitation: 34 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition
Fox and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting
Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile
H1 - 0 to 15 inches: gravelly loam
H2 - 15 to 28 inches: very gravelly sandy clay loam
H3 - 28 to 32 inches: gravelly sandy loam
H4 - 32 to 60 inches: gravelly sand

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FaB—Fox cobbly gravelly loam, 3 to 7 percent slopes

Map Unit Setting
National map unit symbol: 6b3f
Elevation: 800 to 1,000 feet
Mean annual precipitation: 34 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition
Fox and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting
Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile
H1 - 0 to 15 inches: gravelly loam
H2 - 15 to 28 inches: very gravelly sandy clay loam
H3 - 28 to 32 inches: gravelly sandy loam
H4 - 32 to 60 inches: gravelly sand

Properties and qualities
Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FaC2—Fox cobbly gravelly loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b3g
Elevation: 800 to 1,000 feet
Mean annual precipitation: 34 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Fox, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: gravelly loam
H2 - 15 to 28 inches: very gravelly sandy clay loam
H3 - 28 to 32 inches: gravelly sandy loam
H4 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FbA—Fox loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b3h
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FbB—Fox loam, 3 to 7 percent slopes

Map Unit Setting
National map unit symbol: 6b3j
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Fox and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting
Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile
H1 - 0 to 15 inches: loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities
Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent

Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FbC—Fox loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b3k
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent

Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FbC2—Fox loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b3l
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent

Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FcA—Fox sandy loam, till plain, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wvh4
Elevation: 650 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Outwash plains, outwash terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest, tread
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loamy glaciofluvial deposits over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified sand to gravel

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: R111XC010IN - Well Drained Overflow, F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB403IN - Outwash Upland
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

FcB—Fox sandy loam, till plain, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2wvh5
Elevation: 650 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Outwash plains, outwash terraces
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest, tread
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loamy glaciofluvial deposits over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified sand to gravel

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear

Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

FcB2—Fox sandy loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b3p
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: sandy loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland

Hydric soil rating: No

FcC—Fox sandy loam, Huron Lobe, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2wvh6
Elevation: 660 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Moraines, outwash plains, ice-contact slopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Loamy till over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified gravelly sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B

Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Matherton
Percent of map unit: 6 percent
Landform: Drainageways, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sebewa
Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

FcC2—Fox sandy loam, Huron Lobe, 6 to 12 percent slopes, eroded

Map Unit Setting
National map unit symbol: 2wvh7
Elevation: 660 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition
Fox, eroded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Eroded

Setting
Landform: Ice-contact slopes, outwash plains, moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Loamy till over sandy and gravelly outwash

Typical profile

Ap - 0 to 8 inches: sandy loam
Bt1 - 8 to 26 inches: sandy clay loam
Bt2 - 26 to 31 inches: gravelly loam
2C - 31 to 79 inches: stratified gravelly sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R111XC010IN - Well Drained Overflow, F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB403IN - Outwash Upland
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

FcD—Fox sandy loam, Huron Lobe, 12 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2wvh8
Elevation: 650 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Outwash plains, moraines, ice-contact slopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loamy till over sandy and gravelly outwash

Typical profile

A - 0 to 9 inches: sandy loam
Bt1 - 9 to 22 inches: sandy clay loam
Bt2 - 22 to 30 inches: gravelly loam
2C - 30 to 79 inches: stratified gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B

Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Matherton
Percent of map unit: 6 percent
Landform: Drainageways, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sebewa
Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

FcD2—Fox sandy loam, 12 to 25 percent slopes, moderately eroded

Map Unit Setting
National map unit symbol: 6b3t
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition
Fox, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Moderately Eroded

Setting
Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: sandy loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

GaA—Genesee loam, 0 to 2 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: 2z6cv
Elevation: 340 to 1,280 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee, occasionally flooded, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee, Occasionally Flooded

Setting

Landform: Flood-plain steps, natural levees
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

Ap - 0 to 8 inches: loam
Bw - 8 to 32 inches: loam
C - 32 to 79 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 30 to 33 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

Minor Components

Eel, frequently flooded

Percent of map unit: 8 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Sloan, occassionally ponded

Percent of map unit: 7 percent
Landform: Depressions, flood-plain steps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Shoals, occasionally flooded

Percent of map unit: 5 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

GbA—Genesee sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b41
Elevation: 580 to 900 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F099XY008MI - Moist Floodplain
Hydric soil rating: No

GcA—Genesee and Eel loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b43
Elevation: 340 to 900 feet
Mean annual precipitation: 30 to 46 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 120 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee and similar soils: 51 percent
Eel and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

Description of Eel

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: loam
H3 - 20 to 60 inches: stratified sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

GeA—Granby sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b45
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Granby and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Granby

Setting

Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciofluvial deposits and/or sandy glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: fine sand
H3 - 36 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

GfA—Griffin and Genesee loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b46
Elevation: 580 to 1,000 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Genesee and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare

Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

GgA—Griffin and Sloan loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b47
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Sloan and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None

Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Sloan

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 22 inches: clay loam
H3 - 22 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

GhA—Griffin and Sloan sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b48
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Sloan and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Sloan

Setting

Landform: Depressions on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 22 inches: clay loam
H3 - 22 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

Gp—Gravel pits

Map Unit Composition

Gravel pits: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

HaB—Hillsdale sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b49
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Hillsdale and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hillsdale

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 16 inches: sandy loam
H3 - 16 to 48 inches: sandy loam
H4 - 48 to 60 inches: sandy loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

HcA—Hoytville clay loam and silty clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4d
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silty clay loam
H2 - 7 to 36 inches: silty clay

H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

HeA—Hoytville clay loam and Rimer sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4g
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 51 percent
Rimer and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Rimer

Setting

Landform: Outwash deltas on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy over clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 7 inches: loamy sand
H2 - 7 to 15 inches: fine sand
H3 - 15 to 30 inches: sandy loam
H4 - 30 to 60 inches: clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

HfA—Hoytville and Wauseon loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4h
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 51 percent
Wauseon and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Wauseon

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

HgtahA—Houghton muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2zdlc
Elevation: 720 to 1,100 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Houghton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton

Setting

Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 80 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 3 percent
Maximum salinity: Nonsaline to very slightly saline (0.4 to 2.7 mmhos/cm)
Sodium adsorption ratio, maximum: 0.8
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R098XA002MI - Inland Salt Marshes, F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Adrian

Percent of map unit: 4 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Edwards

Percent of map unit: 3 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Palms

Percent of map unit: 2 percent
Landform: Depressions on moraines, swamps on moraines, drainageways on till plains, drainageways on moraines, drainageways on outwash plains, depressions on outwash plains, depressions on till plains, swamps on outwash plains, swamps on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Gilford, gravelly subsoil

Percent of map unit: 1 percent
Landform: Glacial drainage channels, glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA020MI - Wet Sandy Drift Depressions
Hydric soil rating: Yes

HgtaiA—Houghton muck, Erie-Huron lake plain, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2zdk6
Elevation: 630 to 820 feet
Mean annual precipitation: 30 to 37 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 185 days
Farmland classification: Farmland of local importance

Map Unit Composition

Houghton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton

Setting

Landform: Depressions on outwash plains, depressions on moraines on outwash plains

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 80 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 3 percent
Maximum salinity: Nonsaline to very slightly saline (0.4 to 2.7 mmhos/cm)
Sodium adsorption ratio, maximum: 0.8
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F099XY014MI - Mucky Depression
Hydric soil rating: Yes

Minor Components

Adrian

Percent of map unit: 4 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F099XY014MI - Mucky Depression
Hydric soil rating: Yes

Edwards

Percent of map unit: 3 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F099XY014MI - Mucky Depression
Hydric soil rating: Yes

Palms

Percent of map unit: 2 percent
Landform: Drainageways on moraines, drainageways on outwash plains, depressions on outwash plains, depressions on till plains, swamps on outwash plains, swamps on till plains, depressions on moraines, swamps on moraines, drainageways on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F099XY014MI - Mucky Depression
Hydric soil rating: Yes

Gilford, gravelly subsoil

Percent of map unit: 1 percent
Landform: Glacial drainage channels, glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA020MI - Wet Sandy Drift Depressions, F099XY012MI - Cool Wet Sandy Depression
Hydric soil rating: Yes

HgtanA—Houghton muck, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 30n5d
Elevation: 650 to 1,070 feet
Mean annual precipitation: 35 to 41 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Houghton, undrained, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton, Undrained

Setting

Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 79 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very high (about 24.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Minor Components

Palms, undrained

Percent of map unit: 8 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

Muskego, undrained

Percent of map unit: 7 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB002IN - Limnic Muck
Hydric soil rating: Yes

IaA—Ionia loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4j
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ionia and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ionia

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

IaB—Ionia loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b4k
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ionia and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ionia

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

KaC—Kendallville loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b4l
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

KaC2—Kendallville loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b4m
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

KbC—Kendallville sandy loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b4n
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

KcC2—Kendallville soils, 7 to 15 percent slopes, moderately or severely eroded

Map Unit Setting

National map unit symbol: 6b4p
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: clay loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge

Hydric soil rating: No

KdA—Kerston muck and loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4q
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Kerston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kerston

Setting

Landform: Depressions on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over alternating layers of alluvium and/or organic material

Typical profile

Oa1 - 0 to 8 inches: muck
Oa2 - 8 to 15 inches: muck
H3 - 15 to 42 inches: stratified fine sand to silty clay loam
O'a - 42 to 50 inches: muck
H5 - 50 to 60 inches: stratified fine sand to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 14.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

KeA—Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4r
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Kibbie and similar soils: 51 percent
Colwood and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kibbie

Setting

Landform: Knolls on deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

KfA—Kokomo and Barry loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4t
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Kokomo and similar soils: 51 percent
Barry and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kokomo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 31 inches: silty clay loam
H3 - 31 to 60 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Barry

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None

Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

KgA—Kokomo, Barry, and Wallkill loams, overwashed, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b4v
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition
Kokomo and similar soils: 40 percent
Barry and similar soils: 30 percent
Wallkill and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kokomo

Setting
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile
H1 - 0 to 15 inches: loam
H2 - 15 to 31 inches: silty clay loam
H3 - 31 to 60 inches: loam

Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None

Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Barry

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Wallkill

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over organic material

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: fine sandy loam
Oa - 20 to 60 inches: muck

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 19.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

LaA—Lake borders

Map Unit Composition

Lake borders: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lake Borders

Setting

Landform: Beaches

LcA—Linwood muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4y
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 32 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Linwood and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Linwood

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Woody organic material over loamy till

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 31 inches: muck
H3 - 31 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 17.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

Le—Lenawee silty clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2wcf7
Elevation: 560 to 980 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 230 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Lenawee and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lenawee

Setting

Landform: Lakebeds (relict)
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey glaciolacustrine deposits

Typical profile

Ap - 0 to 9 inches: silty clay loam
Bg - 9 to 39 inches: silty clay loam
Cg - 39 to 80 inches: silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 21 percent
Maximum salinity: Nonsaline (0.0 to 0.6 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Del rey

Percent of map unit: 7 percent
Landform: Lakebeds (relict)
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Linear, convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

MaA—Macomb fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b50
Elevation: 600 to 1,000 feet

Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Macomb and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Macomb

Setting
Landform: Drainageways on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile
H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 32 inches: sandy clay loam
H3 - 32 to 60 inches: loam

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

MbA—Macomb sandy clay loam and Hoytville clay loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b51
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 160 days

Farmland classification: Prime farmland if drained

Map Unit Composition

Macomb and similar soils: 51 percent
Hoytville and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Macomb

Setting

Landform: Drainageways on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 32 inches: sandy clay loam
H3 - 32 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

McA—Maumee loamy sand, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b52
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition
Maumee and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Maumee

Setting
Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy glaciofluvial deposits and/or sandy glaciolacustrine deposits

Typical profile
H1 - 0 to 12 inches: loamy sand
H2 - 12 to 60 inches: loamy fine sand

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

MdA—Miami loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b53
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 141 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Miami and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

MeD—Miami loam and Boyer sandy loam, 12 to 25 percent slopes

Map Unit Setting

National map unit symbol: 6b59
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Miami and similar soils: 51 percent
Boyer and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Description of Boyer

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

MeD2—Miami loam and Boyer sandy loam, 12 to 25 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b5b
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Miami, moderately eroded, and similar soils: 60 percent
Boyer, moderately eroded, and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami, Moderately Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C

Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Description of Boyer, Moderately Eroded

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

MeE—Miami loam and Boyer sandy loam, 25+ percent slopes

Map Unit Setting

National map unit symbol: 6b5c
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Miami and similar soils: 60 percent
Boyer and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Description of Boyer

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

MfD3—Miami soils, 15 to 25 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 6b5f
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 141 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Miami, severely eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami, Severely Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: clay loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

MgD3—Miami and Boyer soils, 12 to 25 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 6b5g
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Miami, severely eroded, and similar soils: 51 percent
Boyer, severely eroded, and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami, Severely Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Description of Boyer, Severely Eroded

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent

Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

MgE2—Miami and Boyer soils, 25+ percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b5h
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Miami, moderately eroded, and similar soils: 51 percent
Boyer, moderately eroded, and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami, Moderately Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Description of Boyer, Moderately Eroded

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

MhA—Morley loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b5j
Elevation: 580 to 1,400 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Morley and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhB—Glynwood loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2v4bq
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 31 inches: clay
BC - 31 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 28 to 45 inches to densic material
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Rawson

Percent of map unit: 6 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhB2—Glynwood loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2v4br
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches

Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 7 inches: loam
Bt - 7 to 26 inches: clay
BC - 26 to 30 inches: clay loam
Cd - 30 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 25 to 37 inches to densic material
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Rawson

Percent of map unit: 6 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhC—Morley loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2wp25
Elevation: 570 to 1,120 feet
Mean annual precipitation: 32 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till

Typical profile

Ap - 0 to 9 inches: loam
Bt1 - 9 to 18 inches: clay
Bt2 - 18 to 29 inches: clay
BC - 29 to 35 inches: clay loam

Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 26 to 40 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood

Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhC2—Morley loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wp26
Elevation: 750 to 1,220 feet
Mean annual precipitation: 32 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 165 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 17 inches: clay
Bt2 - 17 to 28 inches: clay
BC - 28 to 33 inches: clay loam
Cd - 33 to 79 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 24 to 38 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C

Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood
Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount
Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo
Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhD—Morley loam, 12 to 25 percent slopes

Map Unit Setting
National map unit symbol: 6b5p
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Morley and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MhD2—Morley loam, 12 to 25 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b5q
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Moderately Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MhE—Morley loam, 25+ percent slopes

Map Unit Setting

National map unit symbol: 6b5r
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MkC3—Morley soils, 7 to 15 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 6b5t
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley, severely eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Severely Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MkD3—Morley clay loam, 12 to 18 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 2wvhl
Elevation: 720 to 1,120 feet
Mean annual precipitation: 35 to 40 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 160 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley, severely eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Severely Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 7 inches: clay loam
Bt - 7 to 25 inches: clay
BC - 25 to 33 inches: clay loam
Cd - 33 to 79 inches: clay loam

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: 26 to 45 inches to densic material
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hennepin, severely eroded

Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Glynwood, severely eroded

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex

Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

NaA—Nappanee silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b5x
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

NaB—Nappanee silt loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b5y
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

NbB—Nappanee loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b60
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on ground moraines

Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

NbB2—Nappanee loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b61
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee, Moderately Eroded

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

OaA—Ogden muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b62
Elevation: 600 to 1,500 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Ogden and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ogden

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

Oa - 0 to 30 inches: muck
H2 - 30 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Very high (about 16.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

ObA—Oshtemo loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b63
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Oshtemo and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oshtemo

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy and/or sandy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: loamy sand
H2 - 14 to 45 inches: sandy loam
H3 - 45 to 60 inches: stratified sand to gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

ObB—Oshtemo loamy sand, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b64
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Oshtemo and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oshtemo

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy and/or sandy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: loamy sand
H2 - 14 to 45 inches: sandy loam
H3 - 45 to 60 inches: stratified gravelly sand to sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PaA—Palms muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b68
Elevation: 250 to 1,500 feet
Mean annual precipitation: 30 to 45 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Palms and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Palms

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material and/or loamy till

Typical profile

Oa1 - 0 to 13 inches: muck
Oa2 - 13 to 32 inches: muck
H3 - 32 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Very high (about 17.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

PbA—Pewamo clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t6lz
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 205 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on till plains, drainageways on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 11 inches: clay loam
Btg1 - 11 to 34 inches: clay
Btg2 - 34 to 47 inches: clay loam
BCg - 47 to 57 inches: clay loam
Cg - 57 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression

Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 8 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Brookston

Percent of map unit: 4 percent
Landform: Drainageways on till plains, depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Palms, undrained

Percent of map unit: 3 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

PcA—Pewamo mucky clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6b
Elevation: 600 to 1,400 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Pewamo and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: mucky silty clay loam
H2 - 7 to 32 inches: clay loam
H3 - 32 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

PdA—Plainfield and Berrien loamy sands, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6c
Elevation: 600 to 1,150 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 51 percent
Berrien and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

PdB—Plainfield and Berrien loamy sands, 3 to 7 percent slopes

Map Unit Setting
National map unit symbol: 6b6d
Elevation: 600 to 1,150 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Plainfield and similar soils: 51 percent
Berrien and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting
Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile
H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities
Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

PeA—Plainfield and Ottawa loamy sands, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6f
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days

Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PeB—Plainfield and Ottawa loamy sands, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b6g
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PeC—Plainfield and Ottawa loamy sands, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b6j
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Beach ridges

Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PeC2—Plainfield and Ottawa loamy sands, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6k
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield, Moderately Eroded

Setting

Landform: Beach ridges

Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PwmaaA—Pewamo clay loam, dense substratum, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2qz3f
Elevation: 670 to 830 feet
Mean annual precipitation: 31 to 36 inches
Mean annual air temperature: 47 to 49 degrees F
Frost-free period: 143 to 182 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo, dense substratum, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo, Dense Substratum

Setting

Landform: Drainageways on nearshore zones (relict), flats on nearshore zones (relict)

Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over dense till

Typical profile

Ap - 0 to 11 inches: clay loam
Btg - 11 to 39 inches: clay loam
BCg - 39 to 56 inches: clay loam
2Cd - 56 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 30 to 70 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Metamora, dense substratum

Percent of map unit: 12 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Blount

Percent of map unit: 4 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Gilford, loamy substratum

Percent of map unit: 2 percent
Landform: Drainageways on nearshore zones (relict), depressions on nearshore zones (relict)
Landform position (three-dimensional): Dip
Down-slope shape: Linear

Across-slope shape: Concave
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Selfridge, dense substratum
Percent of map unit: 2 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

RaA—Rifle peat, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b6l
Elevation: 810 to 850 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 130 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition
Rifle and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rifle

Setting
Landform: Depressions on till plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Woody organic material

Typical profile
Oa - 0 to 14 inches: muck
Oe - 14 to 60 inches: mucky peat

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

RbA—Rollin muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6m
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Rollin and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rollin

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over marl

Typical profile

Oa - 0 to 30 inches: muck
Lma - 30 to 60 inches: marly material

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 90 percent
Available water supply, 0 to 60 inches: Very high (about 15.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: F098XA006MI - Mucky Depressions

Hydric soil rating: Yes

SbA—Sebewa sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6p
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Sebewa and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sebewa

Setting

Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 30 inches: sandy clay loam
H3 - 30 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

ScB—Spinks, Boyer, Plainfield, and Hillsdale soils, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b6q
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Spinks and similar soils: 51 percent
Hillsdale and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Spinks

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loamy sand
H2 - 7 to 20 inches: loamy sand
H3 - 20 to 50 inches: fine sand
H4 - 50 to 60 inches: fine sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Description of Hillsdale

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 16 inches: sandy loam
H3 - 16 to 48 inches: sandy loam
H4 - 48 to 60 inches: sandy loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

ScB2—Spinks, Boyer, Plainfield, and Hillsdale soils, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6r
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Spinks, moderately eroded, and similar soils: 51 percent
Hillsdale, moderately eroded, and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Spinks, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loamy sand
H2 - 7 to 20 inches: loamy sand
H3 - 20 to 50 inches: fine sand
H4 - 50 to 60 inches: fine sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Description of Hillsdale, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 16 inches: sandy loam
H3 - 16 to 48 inches: sandy loam
H4 - 48 to 60 inches: sandy loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

ScC—Spinks, Boyer, Plainfield, and Hillsdale soils, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b6s
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Spinks and similar soils: 51 percent
Hillsdale and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Spinks

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loamy sand
H2 - 7 to 20 inches: loamy sand
H3 - 20 to 50 inches: fine sand
H4 - 50 to 60 inches: fine sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Description of Hillsdale

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 16 inches: sandy loam
H3 - 16 to 48 inches: sandy loam
H4 - 48 to 60 inches: sandy loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

ScC2—Spinks, Boyer, Plainfield, and Hillsdale soils, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6t
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Spinks, moderately eroded, and similar soils: 51 percent
Hillsdale, moderately eroded, and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Spinks, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loamy sand
H2 - 7 to 20 inches: loamy sand
H3 - 20 to 50 inches: fine sand
H4 - 50 to 60 inches: fine sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A

Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Description of Hillsdale, Moderately Eroded

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 16 inches: sandy loam
H3 - 16 to 48 inches: sandy loam
H4 - 48 to 60 inches: sandy loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

ScD2—Spinks, Boyer, Plainfield, and Hillsdale soils, 12 to 25 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6v
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Spinks, moderately eroded, and similar soils: 51 percent
Hillsdale, moderately eroded, and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Spinks, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loamy sand
H2 - 7 to 20 inches: loamy sand
H3 - 20 to 50 inches: fine sand
H4 - 50 to 60 inches: fine sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Description of Hillsdale, Moderately Eroded

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy supraglacial till

Typical profile

H1 - 0 to 7 inches: sandy loam

H2 - 7 to 16 inches: sandy loam
H3 - 16 to 48 inches: sandy loam
H4 - 48 to 60 inches: sandy loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

SdC2—St. Clair loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6x
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

St. clair, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair, Moderately Eroded

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

SdD2—St. Clair loam, 12 to 25 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6y
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

St. clair, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair, Moderately Eroded

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

Sf—Sebewa loam, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2v4bw
Elevation: 570 to 1,070 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 110 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Sebewa and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sebewa

Setting

Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy drift over sandy and gravelly outwash

Typical profile

Ap - 0 to 11 inches: loam
Btg1 - 11 to 21 inches: clay loam
Btg2 - 21 to 33 inches: clay loam
2Cg - 33 to 79 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 23 to 39 inches to strongly contrasting textural stratification
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 45 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 3.0
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: B/D
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Minor Components

Matherton
Percent of map unit: 6 percent
Landform: Drainageways, drainageways on stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Gilford
Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Sg—Sewage lagoons

Map Unit Composition
Sewage lagoons: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

TaA—Tawas muck, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b72
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition
Tawas and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tawas

Setting

Landform: Depressions on strand plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Woody organic material over sandy glaciofluvial deposits

Typical profile

Oa - 0 to 28 inches: muck
H2 - 28 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Very high (about 13.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

Ud—Udorthents, nearly level and undulating

Map Unit Setting

National map unit symbol: 1bxsy
Elevation: 580 to 1,110 feet
Mean annual precipitation: 27 to 32 inches
Mean annual air temperature: 43 to 46 degrees F
Frost-free period: 95 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Landform: Moraines
Landform position (three-dimensional): Rise

Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile
H1 - 0 to 80 inches: silty clay loam

Properties and qualities
Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Hydrologic Soil Group: C
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

W—Water

Map Unit Composition
Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

WaA—Wallkill loam, overwashed, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b73
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Wallkill and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wallkill

Setting
Landform: Depressions on flood plains

Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over organic material

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: fine sandy loam
Oa - 20 to 60 inches: muck

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 19.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

WawaaC—Wawasee clay loam, 6 to 12 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 2wp21
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear

Parent material: Loamy till

Typical profile

Ap - 0 to 6 inches: clay loam
Bt1 - 6 to 21 inches: loam
Bt2 - 21 to 29 inches: clay loam
C - 29 to 79 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawabB—Wawasee loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2wp1x
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 9 inches: loam
Bt1 - 9 to 24 inches: loam
Bt2 - 24 to 33 inches: clay loam
C - 33 to 79 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains

Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawabC—Wawasee loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2wvgl
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: loam

Bt1 - 8 to 24 inches: loam
Bt2 - 24 to 33 inches: clay loam
C - 33 to 79 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawacB—Wawasee loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvgk

Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 24 inches: loam
Bt2 - 24 to 32 inches: clay loam
C - 32 to 79 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawacC—Wawasee loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvgm
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 7 inches: loam
Bt1 - 7 to 23 inches: loam
Bt2 - 23 to 31 inches: clay loam
C - 31 to 79 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawadD—Wawasee loam, 12 to 25 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvgr
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Wawasee and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 7 inches: loam
Bt1 - 7 to 23 inches: loam
Bt2 - 23 to 31 inches: clay loam
C - 31 to 79 inches: loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 6 percent
Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 4 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave

Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WbA—Warners muck and marl, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b74
Elevation: 50 to 1,200 feet
Mean annual precipitation: 28 to 45 inches
Mean annual air temperature: 39 to 54 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Warners and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Warners

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium over marl

Typical profile

Oa - 0 to 10 inches: muck
Lma - 10 to 60 inches: marly material

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 90 percent
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

WcA—Wauseon loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b75
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Wauseon and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wauseon

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

WdA—Willette muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b76
Elevation: 600 to 1,500 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Willette and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Willette

Setting

Landform: Depressions, depressions
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Organic material over loamy till and/or lacustrine deposits

Typical profile

Oa - 0 to 30 inches: muck
H2 - 30 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Very high (about 16.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

ZfsacA—Ziegenfuss clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2qz3g
Elevation: 570 to 790 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Ziegenfuss and similar soils: 86 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ziegenfuss

Setting

Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over loamy till

Typical profile

Ap - 0 to 9 inches: clay loam
Bg - 9 to 30 inches: clay loam
BC - 30 to 40 inches: clay loam
C - 40 to 67 inches: clay loam
2Cd - 67 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 60 to 80 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 28 percent
Maximum salinity: Nonsaline (0.1 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 9 percent
Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Houcktown

Percent of map unit: 5 percent
Landform: Wave-worked till plains
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Monroe County, Michigan

43A—Nappanee loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 68vb
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 24 inches: clay
H3 - 24 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Metamora

Percent of map unit: 5 percent
Landform: Knolls on till plains

Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

114A—Nappanee silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b5x
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Hoytville
Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

ZfsacA—Ziegenfuss clay loam, 0 to 1 percent slopes

Map Unit Setting
National map unit symbol: 2qz3g
Elevation: 570 to 790 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Ziegenfuss and similar soils: 86 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ziegenfuss

Setting
Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over loamy till

Typical profile
Ap - 0 to 9 inches: clay loam
Bg - 9 to 30 inches: clay loam
BC - 30 to 40 inches: clay loam
C - 40 to 67 inches: clay loam
2Cd - 67 to 80 inches: clay loam

Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: 60 to 80 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 28 percent
Maximum salinity: Nonsaline (0.1 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 9 percent
Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Houcktown

Percent of map unit: 5 percent
Landform: Wave-worked till plains
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

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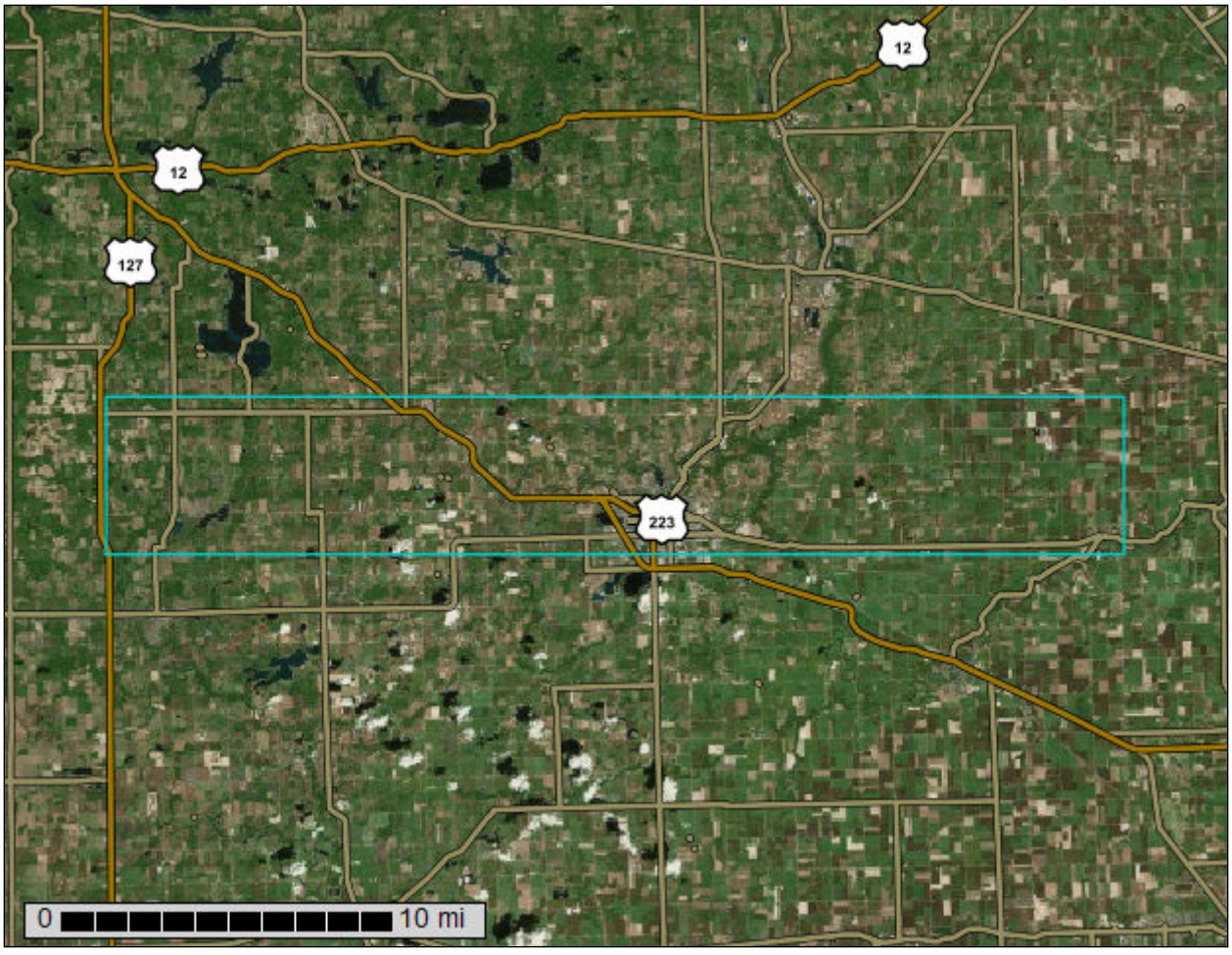
Custom Soil Resource Report for Hillsdale County, Michigan, Lenawee County, Michigan, and Monroe County, Michigan



June 13, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

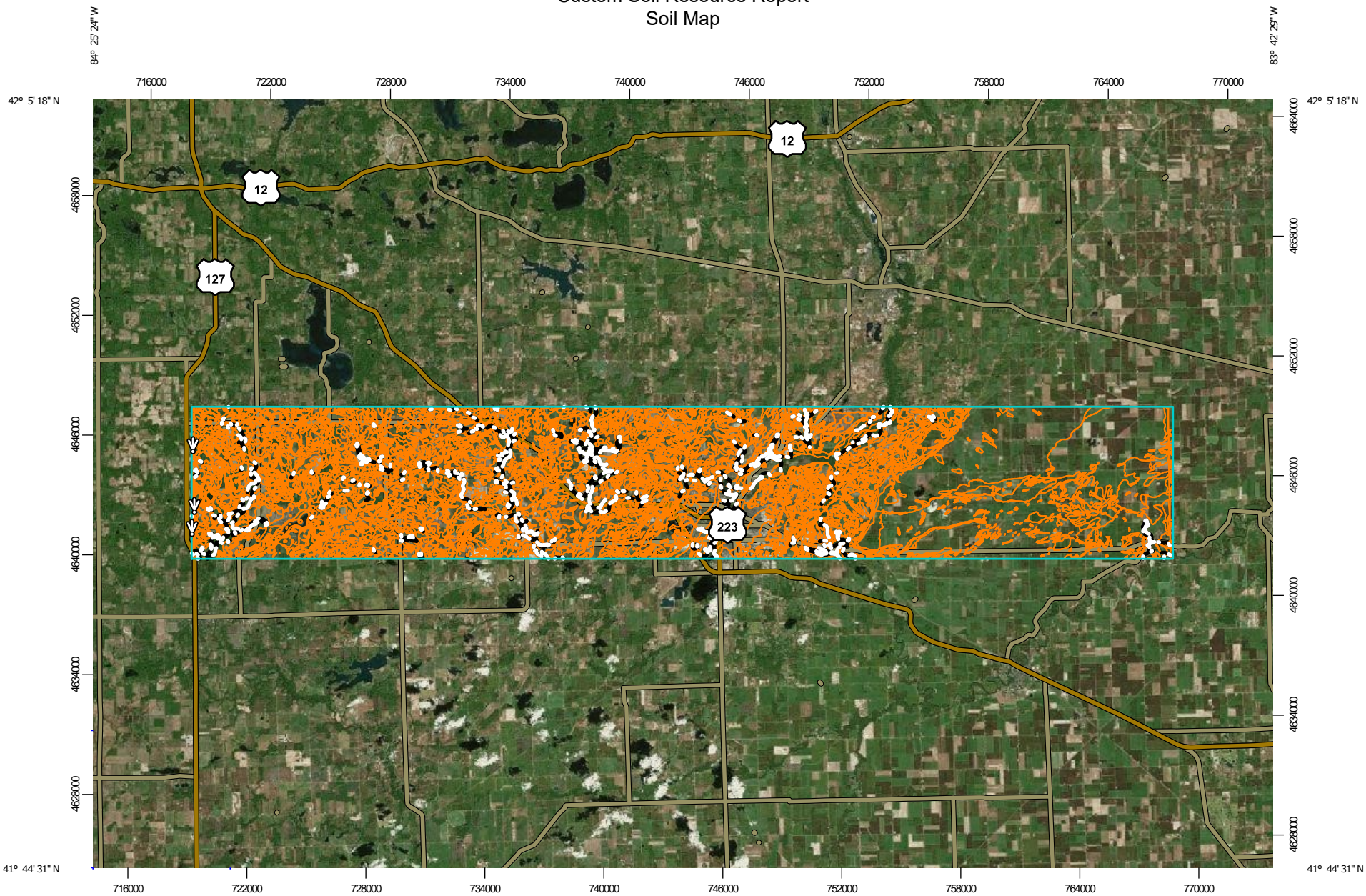
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:15,800 to 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hillsdale County, Michigan
Survey Area Data: Version 22, Aug 27, 2024

Soil Survey Area: Lenawee County, Michigan
Survey Area Data: Version 20, Aug 27, 2024

Soil Survey Area: Monroe County, Michigan
Survey Area Data: Version 22, Aug 27, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

MAP LEGEND

MAP INFORMATION

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
10B	Hillsdale-Riddles sandy loams, 1 to 6 percent slopes	2.1	0.0%
10C2	Hillsdale-Riddles sandy loams, 6 to 12 percent slopes	7.4	0.0%
12B	Williamstown-Conover complex, 1 to 6 percent slopes	21.2	0.0%
12C2	Wawasee loam, 6 to 12 percent slopes, eroded	16.1	0.0%
12D2	Wawasee clay loam, 12 to 18 percent slopes, eroded	0.4	0.0%
13B	Conover loam, 1 to 4 percent slopes	15.0	0.0%
14	Wolcott silt loam	3.9	0.0%
15C	Boyer loamy sand, 6 to 12 percent slopes	3.4	0.0%
16B	Fox sandy loam, till plain, 2 to 6 percent slopes	31.8	0.0%
16C2	Fox sandy loam, Huron Lobe, 6 to 12 percent slopes, eroded	20.1	0.0%
16D2	Fox gravelly sandy loam, 12 to 18 percent slopes, eroded	4.6	0.0%
17	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	2.3	0.0%
18B	Glynwood-Blount complex, 1 to 6 percent slopes	19.9	0.0%
18C2	Morley loam, 6 to 12 percent slopes, eroded	4.1	0.0%
18E	Morley loam, 18 to 35 percent slopes	3.2	0.0%
19B	Blount loam, 0 to 4 percent slopes	6.8	0.0%
20	Pewamo silt loam	1.3	0.0%
24C	Spinks loamy sand, 6 to 12 percent slopes	1.4	0.0%
24D	Spinks loamy sand, 12 to 18 percent slopes	4.6	0.0%
29B	Steamburg sandy loam, 2 to 6 percent slopes	24.8	0.0%
32	Sloan silt loam, 0 to 1 percent slopes, frequently flooded	10.4	0.0%
34	Adrian muck	0.2	0.0%
35	Palms muck	11.6	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
37A	Matherton loam, 0 to 3 percent slopes	16.8	0.0%
39	Gilford fine sandy loam, till plain, 0 to 2 percent slopes	4.3	0.0%
43	Histosols and Aquents, ponded	3.5	0.0%
46	Wallkill silt loam	4.1	0.0%
50C	Coloma sand, 6 to 18 percent slopes	2.6	0.0%
55	Pits, gravel	0.0	0.0%
HgtahA	Houghton muck, 0 to 1 percent slopes	23.3	0.0%
W	Water	11.7	0.0%
Subtotals for Soil Survey Area		**283.1**	**0.3%**
Totals for Area of Interest		**93,289.8**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BaA	Barry sandy loam, overwashed, 0 to 3 percent slopes	258.3	0.3%
BbA	Berrien loamy sand, 0 to 3 percent slopes	49.0	0.1%
BbB	Berrien loamy sand, 3 to 7 percent slopes	83.7	0.1%
BcA	Berrien sandy loam, 0 to 3 percent slopes	382.9	0.4%
BcB	Berrien sandy loam, 3 to 7 percent slopes	875.1	0.9%
BcC	Berrien sandy loam, 7 to 15 percent slopes	20.0	0.0%
BdA	Berville loam, 0 to 3 percent slopes	2.5	0.0%
BeA	Berville sandy loam, 0 to 3 percent slopes	12.0	0.0%
BfA2	Blount loam, 0 to 3 percent slopes, moderately eroded	17.5	0.0%
BgA	Blount loam and Pewamo clay loam, 0 to 3 percent slopes	10.7	0.0%
BhA	Brady sandy loam, 0 to 3 percent slopes	586.3	0.6%
BkA	Brady and Macomb loams, 0 to 3 percent slopes	7,473.6	8.0%
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	121.6	0.1%
BnA	Bronson sandy loam, 0 to 3 percent slopes	117.8	0.1%
BnB	Bronson sandy loam, 3 to 7 percent slopes	66.1	0.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BntaaA	Blount loam, 0 to 2 percent slopes	3,298.4	3.5%
BntaaB	Blount loam, 2 to 6 percent slopes	6,633.3	7.1%
BntabB	Blount loam, 2 to 6 percent slopes, eroded	573.0	0.6%
BoA	Brookston loam, 0 to 3 percent slopes	389.0	0.4%
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	1,085.6	1.2%
CaB	Cadmus loam, 3 to 7 percent slopes	1,369.6	1.5%
CaB2	Cadmus loam, 3 to 7 percent slopes, moderately eroded	216.7	0.2%
CarabA	Carlisle muck, 0 to 2 percent slopes	316.8	0.3%
CaracA	Carlisle muck, disintegration moraine, 0 to 2 percent slopes	1,163.2	1.2%
CbA	Cadmus sandy loam, 0 to 3 percent slopes	45.0	0.0%
CbB	Cadmus sandy loam, 3 to 7 percent slopes	430.3	0.5%
CcA	Cadmus and Blount loams, 0 to 3 percent slopes	725.3	0.8%
CeA	Colwood very fine sandy loam, 0 to 3 percent slopes	566.8	0.6%
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	319.2	0.3%
CgA	Conover loam, 0 to 3 percent slopes	534.3	0.6%
CgB	Conover loam, 3 to 7 percent slopes	302.5	0.3%
Co	Colwood loam	2,655.2	2.8%
Cr	Corunna sandy loam	5.2	0.0%
Cs	Ceresco fine sandy loam	11.5	0.0%
EaA	Edwards muck, 0 to 3 percent slopes	114.2	0.1%
FbA	Fox loam, 0 to 3 percent slopes	465.8	0.5%
FbB	Fox loam, 3 to 7 percent slopes	478.1	0.5%
FbC	Fox loam, 7 to 15 percent slopes	77.3	0.1%
FbC2	Fox loam, 7 to 15 percent slopes, moderately eroded	55.6	0.1%
FcA	Fox sandy loam, till plain, 0 to 2 percent slopes	305.4	0.3%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
FcB	Fox sandy loam, till plain, 2 to 6 percent slopes	672.4	0.7%
FcB2	Fox sandy loam, 3 to 7 percent slopes, moderately eroded	60.6	0.1%
FcC	Fox sandy loam, Huron Lobe, 6 to 12 percent slopes	5.6	0.0%
FcC2	Fox sandy loam, Huron Lobe, 6 to 12 percent slopes, eroded	226.6	0.2%
FcD2	Fox sandy loam, 12 to 25 percent slopes, moderately eroded	45.6	0.0%
FcE	Fox sandy loam, 25+ percent slopes	78.3	0.1%
FdD3	Fox soils, 12 to 25 percent slopes, severely eroded	1.2	0.0%
GaA	Genesee loam, 0 to 2 percent slopes, occasionally flooded	229.6	0.2%
GbA	Genesee sandy loam, 0 to 3 percent slopes	56.8	0.1%
GcA	Genesee and Eel loams, 0 to 3 percent slopes	339.3	0.4%
GdA	Granby loamy sand, 0 to 3 percent slopes	46.5	0.0%
GeA	Granby sandy loam, 0 to 3 percent slopes	78.6	0.1%
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	2,733.3	2.9%
GgA	Griffin and Sloan loams, 0 to 3 percent slopes	209.8	0.2%
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	1,606.4	1.7%
Gp	Gravel pits	34.2	0.0%
HaB	Hillsdale sandy loam, 3 to 7 percent slopes	55.7	0.1%
HaC2	Hillsdale sandy loam, 7 to 15 percent slopes, moderately eroded	14.3	0.0%
HcA	Hoytville clay loam and silty clay loam, 0 to 3 percent slopes	628.0	0.7%
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	1,094.1	1.2%
HgtahA	Houghton muck, 0 to 1 percent slopes	151.5	0.2%
HgtaiA	Houghton muck, Erie-Huron lake plain, 0 to 1 percent slopes	23.5	0.0%
HgtanA	Houghton muck, disintegration moraine, 0 to 2 percent slopes	402.4	0.4%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
IaA	Ionia loam, 0 to 3 percent slopes	508.0	0.5%
IaB	Ionia loam, 3 to 7 percent slopes	368.1	0.4%
KaC	Kendallville loam, 7 to 15 percent slopes	99.4	0.1%
KaC2	Kendallville loam, 7 to 15 percent slopes, moderately eroded	123.8	0.1%
KbC	Kendallville sandy loam, 7 to 15 percent slopes	104.5	0.1%
KcC2	Kendallville soils, 7 to 15 percent slopes, moderately or severely eroded	21.1	0.0%
KdA	Kerston muck and loams, 0 to 3 percent slopes	196.5	0.2%
KeA	Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes	187.4	0.2%
KfA	Kokomo and Barry loams, 0 to 3 percent slopes	970.9	1.0%
KgA	Kokomo, Barry, and Wallkill loams, overwashed, 0 to 3 percent slopes	591.3	0.6%
LaA	Lake borders	26.7	0.0%
LcA	Linwood muck, 0 to 3 percent slopes	54.5	0.1%
Le	Lenawee silty clay loam, 0 to 1 percent slopes	5,028.3	5.4%
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	502.7	0.5%
MbA	Macomb sandy clay loam and Hoytville clay loam, 0 to 3 percent slopes	256.7	0.3%
MdA	Miami loam, 0 to 3 percent slopes	21.5	0.0%
MeD	Miami loam and Boyer sandy loam, 12 to 25 percent slopes	34.8	0.0%
MeD2	Miami loam and Boyer sandy loam, 12 to 25 percent slopes, moderately eroded	474.6	0.5%
MfD3	Miami soils, 15 to 25 percent slopes, severely eroded	25.7	0.0%
MhA	Morley loam, 0 to 3 percent slopes	27.8	0.0%
MhB	Glynwood loam, 2 to 6 percent slopes	1,804.4	1.9%
MhB2	Glynwood loam, 2 to 6 percent slopes, eroded	9,413.8	10.1%
MhC	Morley loam, 6 to 12 percent slopes	424.0	0.5%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MhC2	Morley loam, 6 to 12 percent slopes, eroded	4,748.0	5.1%
MhD	Morley loam, 12 to 25 percent slopes	92.1	0.1%
MhD2	Morley loam, 12 to 25 percent slopes, moderately eroded	1,252.8	1.3%
MhE	Morley loam, 25+ percent slopes	75.4	0.1%
MkB3	Glynwood clay loam, 2 to 6 percent slopes, severely eroded	9.5	0.0%
MkC3	Morley soils, 7 to 15 percent slopes, severely eroded	518.0	0.6%
MkD3	Morley clay loam, 12 to 18 percent slopes, severely eroded	258.8	0.3%
MkE2	Morley soils, 25+ percent slopes, moderately or severely eroded	68.6	0.1%
MmA	Metamora sandy loam, 0 to 3 percent slopes	12.6	0.0%
MnA	Metamora-Corunna sandy loams, 0 to 3 percent slopes	72.5	0.1%
NaA	Nappanee silt loam, 0 to 3 percent slopes	1,404.9	1.5%
NaB	Nappanee silt loam, 3 to 7 percent slopes	104.9	0.1%
NaB2	Nappanee silt loam, 3 to 7 percent slopes, moderately eroded	435.8	0.5%
NbB	Nappanee loam, 3 to 7 percent slopes	182.2	0.2%
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	997.0	1.1%
OaA	Ogden muck, 0 to 3 percent slopes	23.6	0.0%
ObA	Oshtemo loamy sand, 0 to 3 percent slopes	81.7	0.1%
ObB	Oshtemo loamy sand, 3 to 7 percent slopes	285.0	0.3%
ObC	Oshtemo loamy sand, 7 to 15 percent slopes	4.8	0.0%
OcC	Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded	1.9	0.0%
OkB	Oakville fine sand, loamy substratum, 0 to 6 percent slopes	16.4	0.0%
OsB	Ottokee variant fine sand, 0 to 6 percent slopes	0.7	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PaA	Palms muck, 0 to 3 percent slopes	25.4	0.0%
PbA	Pewamo clay loam, 0 to 2 percent slopes	2,514.9	2.7%
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	306.7	0.3%
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	504.4	0.5%
PdB	Plainfield and Berrien loamy sands, 3 to 7 percent slopes	100.3	0.1%
PeB	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes	823.8	0.9%
PeB2	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes, moderately eroded	17.6	0.0%
PeC	Plainfield and Ottawa loamy sands, 7 to 15 percent slopes	563.4	0.6%
PeC2	Plainfield and Ottawa loamy sands, 7 to 15 percent slopes, moderately eroded	6.6	0.0%
PwmaaA	Pewamo clay loam, dense substratum, 0 to 1 percent slopes	253.6	0.3%
RaA	Rifle peat, 0 to 3 percent slopes	38.7	0.0%
RbA	Rollin muck, 0 to 3 percent slopes	45.5	0.0%
SbA	Sebewa sandy loam, 0 to 3 percent slopes	155.3	0.2%
ScB	Spinks, Boyer, Plainfield, and Hillsdale soils, 3 to 7 percent slopes	4.7	0.0%
ScB2	Spinks, Boyer, Plainfield, and Hillsdale soils, 3 to 7 percent slopes, moderately eroded	71.6	0.1%
ScC	Spinks, Boyer, Plainfield, and Hillsdale soils, 7 to 15 percent slopes	14.1	0.0%
ScC2	Spinks, Boyer, Plainfield, and Hillsdale soils, 7 to 15 percent slopes, moderately eroded	284.6	0.3%
ScD2	Spinks, Boyer, Plainfield, and Hillsdale soils, 12 to 25 percent slopes, moderately eroded	24.7	0.0%
SdC	St. Clair loam, 7 to 15 percent slopes	6.2	0.0%
SdC2	St. Clair loam, 7 to 15 percent slopes, moderately eroded	288.0	0.3%
SdD2	St. Clair loam, 12 to 25 percent slopes, moderately eroded	86.2	0.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
SdE	St. Clair loam, 25+ percent slopes	3.8	0.0%
SdE2	St. Clair loam, 25+ percent slopes, moderately eroded	142.7	0.2%
SeC3	St. Clair soils, 7 to 15 percent slopes, severely eroded	73.1	0.1%
Sf	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	129.8	0.1%
ShA	Selfridge-Pewamo complex, 0 to 3 percent slopes	86.2	0.1%
Sl	Sloan loam	7.3	0.0%
TaA	Tawas muck, 0 to 3 percent slopes	8.2	0.0%
Ud	Udorthents, nearly level and undulating	23.3	0.0%
W	Water	602.3	0.6%
WaA	Wallkill loam, overwashed, 0 to 3 percent slopes	126.6	0.1%
WawabB	Wawasee loam, 2 to 6 percent slopes	632.9	0.7%
WawabC	Wawasee loam, 6 to 12 percent slopes	475.9	0.5%
WawacB	Wawasee loam, 2 to 6 percent slopes, eroded	1,174.3	1.3%
WawacC	Wawasee loam, 6 to 12 percent slopes, eroded	1,296.7	1.4%
WawadD	Wawasee loam, 12 to 25 percent slopes, eroded	33.3	0.0%
WbA	Warners muck and marl, 0 to 3 percent slopes	101.2	0.1%
WcA	Wauseon loam, 0 to 3 percent slopes	1,673.8	1.8%
WdA	Willette muck, 0 to 3 percent slopes	104.4	0.1%
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	6,560.1	7.0%
Subtotals for Soil Survey Area		**92,314.7**	**99.0%**
Totals for Area of Interest		**93,289.8**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
13A	Blount loam, Erie-Huron Lake Plain, 0 to 2 percent slopes	2.0	0.0%
17A	Metamora-Corunna sandy loams, 0 to 3 percent slopes	33.3	0.0%
19A	Selfridge loamy sand, 0 to 3 percent slopes	10.4	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
20A	Selfridge-Pewamo complex, 0 to 3 percent slopes	57.0	0.1%
21	Lenawee silty clay loam, 0 to 1 percent slopes	12.9	0.0%
22	Pewamo clay loam	91.1	0.1%
23A	Metamora sandy loam, 0 to 3 percent slopes	16.6	0.0%
24	Corunna sandy loam	7.8	0.0%
29	Colwood loam	49.1	0.1%
30	Sloan loam	0.4	0.0%
37B	Ottokee variant fine sand, 0 to 6 percent slopes	2.5	0.0%
40A	Thetford loamy sand, 0 to 3 percent slopes	6.7	0.0%
46	Ceresco fine sandy loam	11.6	0.0%
49B	Oakville fine sand, loamy substratum, 0 to 6 percent slopes	5.7	0.0%
50B	Ottokee fine sand, 0 to 6 percent slopes	1.5	0.0%
116A	Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes	36.2	0.0%
W	Water	2.1	0.0%
Subtotals for Soil Survey Area		**346.8**	**0.4%**
Totals for Area of Interest		**93,289.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a

particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Hillsdale County, Michigan

10B—Hillsdale-Riddles sandy loams, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 31b2l
Elevation: 870 to 1,170 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Hillsdale and similar soils: 50 percent
Riddles and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hillsdale

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Base slope, interfluve, nose slope, side slope
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy till

Typical profile

Ap - 0 to 10 inches: sandy loam
E - 10 to 14 inches: sandy loam
Bt - 14 to 38 inches: sandy loam
BC - 38 to 60 inches: sandy loam
C - 60 to 79 inches: sandy loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 8.0
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B

Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Description of Riddles

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: sandy loam
E - 8 to 13 inches: sandy loam
Bt1 - 13 to 23 inches: sandy clay loam
Bt2 - 23 to 42 inches: sandy clay loam
BC - 42 to 55 inches: sandy loam
C - 55 to 79 inches: sandy loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 9.0
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Spinks

Percent of map unit: 8 percent
Landform: Moraines, glacial drainage channels
Landform position (two-dimensional): Summit, shoulder, backslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, tread
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F098XA013MI - Piney Dry Sandy Drift Plains
Hydric soil rating: No

Teasdale

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Rise
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Locke

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Barry

Percent of map unit: 1 percent
Landform: Flats on till plains, depressions on moraines, drainageways on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Concave
Across-slope shape: Concave, linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

10C2—Hillsdale-Riddles sandy loams, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 31b2m
Elevation: 890 to 1,190 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Hillsdale and similar soils: 50 percent
Riddles and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hillsdale

Setting

Landform: End moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Coarse-loamy till

Typical profile

Ap - 0 to 9 inches: sandy loam
E - 9 to 14 inches: sandy loam
Bt - 14 to 38 inches: sandy loam
BC - 38 to 60 inches: sandy loam
C - 60 to 79 inches: sandy loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 8.0
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Description of Riddles

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: sandy loam
E - 8 to 13 inches: sandy loam
Bt1 - 13 to 23 inches: sandy clay loam
Bt2 - 23 to 42 inches: sandy clay loam
BC - 42 to 55 inches: sandy loam
C - 55 to 79 inches: sandy loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 9.0
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Spinks

Percent of map unit: 9 percent
Landform: Moraines, outwash plains, glacial drainage channels
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, head slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F098XA013MI - Piney Dry Sandy Drift Plains
Hydric soil rating: No

Teasdale

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Rise
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Locke

Percent of map unit: 2 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Barry

Percent of map unit: 1 percent

Landform: Flats on till plains, depressions on moraines, drainageways on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Concave
Across-slope shape: Concave, linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

12B—Williamstown-Conover complex, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 6b8c
Elevation: 580 to 1,200 feet
Mean annual precipitation: 30 to 45 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Williamstown and similar soils: 62 percent
Conover and similar soils: 32 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Williamstown

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 33 inches: clay loam
H3 - 33 to 60 inches: loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 18 to 39 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 50 percent
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Description of Conover

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 27 inches: clay loam
H3 - 27 to 60 inches: loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Steamburg

Percent of map unit: 3 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Wolcott

Percent of map unit: 3 percent
Landform: Ground moraines, depressions

Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

12C2—Wawasee loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvgm
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 7 inches: loam
Bt1 - 7 to 23 inches: loam
Bt2 - 23 to 31 inches: clay loam
C - 31 to 79 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

12D2—Wawasee clay loam, 12 to 18 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvgy
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope

Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 7 inches: clay loam
Bt1 - 7 to 23 inches: loam
Bt2 - 23 to 31 inches: clay loam
C - 31 to 79 inches: loam

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

13B—Conover loam, 1 to 4 percent slopes

Map Unit Setting

National map unit symbol: 6b8h
Elevation: 580 to 1,000 feet
Mean annual precipitation: 30 to 45 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 27 inches: clay loam
H3 - 27 to 60 inches: loam

Properties and qualities

Slope: 1 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Williamstown

Percent of map unit: 4 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Wolcott

Percent of map unit: 4 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Sloan

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

14—Wolcott silt loam

Map Unit Setting

National map unit symbol: 6b8j
Elevation: 580 to 1,000 feet
Mean annual precipitation: 28 to 45 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Wolcott and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wolcott

Setting

Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear

Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 20 inches: silt loam
H2 - 20 to 38 inches: clay loam
H3 - 38 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 11.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Minor Components

Conover

Percent of map unit: 1 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sloan

Percent of map unit: 1 percent
Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

Houghton

Percent of map unit: 1 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

15C—Boyer loamy sand, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2t6l3
Elevation: 700 to 1,250 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Boyer and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boyer

Setting

Landform: Stream terraces, moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, riser
Down-slope shape: Linear
Across-slope shape: Convex, linear
Parent material: Loamy outwash and/or sandy outwash over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: loamy sand
E - 9 to 17 inches: loamy sand
Bt - 17 to 30 inches: sandy loam
2C - 30 to 79 inches: stratified coarse sand to gravelly sand to very gravelly sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: A
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Minor Components

Oshtemo
Percent of map unit: 9 percent
Landform: Stream terraces, moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, riser
Down-slope shape: Linear
Across-slope shape: Convex, linear
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Spinks
Percent of map unit: 6 percent
Landform: Moraines, stream terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, riser
Down-slope shape: Linear
Across-slope shape: Linear, convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

16B—Fox sandy loam, till plain, 2 to 6 percent slopes

Map Unit Setting
National map unit symbol: 2wvh5
Elevation: 650 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting
Landform: Outwash plains, outwash terraces
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest, tread
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loamy glaciofluvial deposits over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified sand to gravel

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

16C2—Fox sandy loam, Huron Lobe, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvh7
Elevation: 660 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox, eroded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Eroded

Setting

Landform: Ice-contact slopes, outwash plains, moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Loamy till over sandy and gravelly outwash

Typical profile

Ap - 0 to 8 inches: sandy loam
Bt1 - 8 to 26 inches: sandy clay loam
Bt2 - 26 to 31 inches: gravelly loam
2C - 31 to 79 inches: stratified gravelly sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B

Ecological site: R111XC010IN - Well Drained Overflow, F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Matherton
Percent of map unit: 6 percent
Landform: Drainageways, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB403IN - Outwash Upland
Hydric soil rating: No

Sebewa
Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

16D2—Fox gravelly sandy loam, 12 to 18 percent slopes, eroded

Map Unit Setting
National map unit symbol: 6b8r
Elevation: 580 to 1,300 feet
Mean annual precipitation: 30 to 42 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Fox and similar soils: 87 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting
Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear

Across-slope shape: Concave, convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: gravelly sandy loam
H2 - 8 to 34 inches: gravelly sandy clay loam
H3 - 34 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Hillsdale

Percent of map unit: 6 percent
Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Riddles

Percent of map unit: 6 percent
Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Sebewa

Percent of map unit: 1 percent
Landform: Drainageways on ice-contact slopes

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

17—Sebewa loam, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2v4bw
Elevation: 570 to 1,070 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 110 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Sebewa and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sebewa

Setting

Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy drift over sandy and gravelly outwash

Typical profile

Ap - 0 to 11 inches: loam
Btg1 - 11 to 21 inches: clay loam
Btg2 - 21 to 33 inches: clay loam
2Cg - 33 to 79 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 23 to 39 inches to strongly contrasting textural stratification
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 45 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 3.0
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways, drainageways on stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Gilford

Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

18B—Glynwood-Blount complex, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 6b8v
Elevation: 580 to 1,530 feet
Mean annual precipitation: 29 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Glynwood and similar soils: 57 percent
Blount and similar soils: 37 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 26 inches: clay loam
H3 - 26 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Description of Blount

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 32 inches: silty clay loam
H3 - 32 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 3 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Steamburg

Percent of map unit: 3 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

18C2—Morley loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wp26
Elevation: 750 to 1,220 feet
Mean annual precipitation: 32 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 165 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines

Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 17 inches: clay
Bt2 - 17 to 28 inches: clay
BC - 28 to 33 inches: clay loam
Cd - 33 to 79 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 24 to 38 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood

Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

18E—Morley loam, 18 to 35 percent slopes

Map Unit Setting

National map unit symbol: 6b8y
Elevation: 580 to 1,400 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Typical profile

H1 - 0 to 6 inches: loam
H2 - 6 to 31 inches: clay loam
H3 - 31 to 60 inches: clay loam

Properties and qualities

Slope: 18 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Coloma

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Hydric soil rating: No

Pewamo

Percent of map unit: 1 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Sloan

Percent of map unit: 1 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

19B—Blount loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 2ydcv
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F

Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, concave
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 30 inches: silty clay
BC - 30 to 37 inches: clay loam
Cd - 37 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: 26 to 48 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Glynwood

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 6 percent
Landform: Depressions, ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Conover

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Badaxe

Percent of map unit: 2 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

20—Pewamo silt loam

Map Unit Setting

National map unit symbol: 6b90
Elevation: 580 to 1,530 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear

Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 11 inches: silt loam
H2 - 11 to 48 inches: clay loam
H3 - 48 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Minor Components

Houghton

Percent of map unit: 1 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Blount

Percent of map unit: 1 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Glynwood

Percent of map unit: 1 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

24C—Spinks loamy sand, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 6b92
Elevation: 580 to 1,200 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Spinks and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Spinks

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: loamy sand
H2 - 9 to 60 inches: sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Minor Components

Thetford

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA019MI - Moist Sandy Drift Plains
Hydric soil rating: No

Morley

Percent of map unit: 2 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Miami

Percent of map unit: 2 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

24D—Spinks loamy sand, 12 to 18 percent slopes

Map Unit Setting

National map unit symbol: 6b93
Elevation: 580 to 1,200 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Spinks and similar soils: 93 percent
Minor components: 7 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Spinks

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: loamy sand
H2 - 9 to 60 inches: sand

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: F098XA021MI - Sandy Slopes
Hydric soil rating: No

Minor Components

Miami

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Morley

Percent of map unit: 2 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Thetford

Percent of map unit: 2 percent
Landform: Moraines
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA019MI - Moist Sandy Drift Plains
Hydric soil rating: No

29B—Steamburg sandy loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 6b95
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Steamburg and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Steamburg

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 9 inches: sandy loam
H2 - 9 to 34 inches: sandy loam
H3 - 34 to 40 inches: clay loam
H4 - 40 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained

Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Fox
Percent of map unit: 3 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Williamstown
Percent of map unit: 2 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Spinks
Percent of map unit: 2 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

32—Sloan silt loam, 0 to 1 percent slopes, frequently flooded

Map Unit Setting
National map unit symbol: 2ydd3
Elevation: 520 to 1,340 feet
Mean annual precipitation: 31 to 42 inches

Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 200 days
Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Sloan, frequently flooded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sloan, Frequently Flooded

Setting

Landform: Depressions on flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy alluvium

Typical profile

Ap - 0 to 12 inches: silt loam
Bg - 12 to 42 inches: silty clay loam
Cg - 42 to 79 inches: stratified gravelly sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: Occasional
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

Minor Components

Shoals

Percent of map unit: 6 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA003MI - Moist Floodplains
Hydric soil rating: No

Sloan, frequently flooded, long duration

Percent of map unit: 4 percent
Landform: Depressions on flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

34—Adrian muck

Map Unit Setting

National map unit symbol: 6b9b
Elevation: 360 to 1,300 feet
Mean annual precipitation: 26 to 45 inches
Mean annual air temperature: 41 to 52 degrees F
Frost-free period: 90 to 190 days
Farmland classification: Farmland of local importance

Map Unit Composition

Adrian and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Adrian

Setting

Landform: Backswamps on flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over sandy glaciofluvial deposits

Typical profile

Oa - 0 to 26 inches: muck
H2 - 26 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Very high (about 12.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Glendora

Percent of map unit: 1 percent
Landform: Oxbows on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

Gilford

Percent of map unit: 1 percent
Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Edwards

Percent of map unit: 1 percent
Landform: Backswamps on flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

35—Palms muck

Map Unit Setting

National map unit symbol: 6b9c
Elevation: 250 to 1,500 feet
Mean annual precipitation: 30 to 45 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Palms and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Palms

Setting

Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over loamy topple deposits

Typical profile

Oa1 - 0 to 13 inches: muck
Oa2 - 13 to 16 inches: muck
H3 - 16 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Very high (about 14.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Edwards

Percent of map unit: 1 percent
Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Wolcott

Percent of map unit: 1 percent
Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Sloan

Percent of map unit: 1 percent
Landform: Flood plains, oxbows on flood plains

Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

37A—Matherton loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b9d
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Matherton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Matherton

Setting

Landform: Knolls on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 25 inches: loam
H3 - 25 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: B/D
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Fox

Percent of map unit: 3 percent
Landform: Knolls on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Sebewa

Percent of map unit: 3 percent
Landform: Depressions on outwash plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Glynwood

Percent of map unit: 2 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Williamstown

Percent of map unit: 2 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

39—Gilford fine sandy loam, till plain, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t6mr
Elevation: 660 to 1,250 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Gilford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gilford

Setting

Landform: Glacial drainage channels, glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave, linear
Parent material: Coarse-loamy drift over sandy and gravelly outwash

Typical profile

Ap - 0 to 11 inches: fine sandy loam
Bg - 11 to 30 inches: sandy loam
BCg - 30 to 35 inches: loamy sand
Cg - 35 to 79 inches: gravelly sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 26 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

Minor Components

Rensselaer

Percent of map unit: 7 percent
Landform: Depressions on glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

Brady

Percent of map unit: 5 percent
Landform: Glacial drainage channels, glacial drainage channels
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Adrian

Percent of map unit: 3 percent
Landform: Depressions on glacial drainage channels, depressions on glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Concave, linear
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

43—Histosols and Aquents, ponded

Map Unit Setting

National map unit symbol: 6b9n
Elevation: 580 to 1,530 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Histosols and similar soils: 60 percent
Aquents and similar soils: 35 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Histosols

Setting

Landform: Marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material

Typical profile

Oa - 0 to 16 inches: muck
H2 - 16 to 60 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: A/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Description of Aquents

Setting

Landform: Marshes
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium

Typical profile

H1 - 0 to 60 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: A/D
Ecological site: F098XA020MI - Wet Sandy Drift Depressions
Hydric soil rating: Yes

Minor Components

Thetford

Percent of map unit: 2 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear

Across-slope shape: Convex
Ecological site: F098XA019MI - Moist Sandy Drift Plains
Hydric soil rating: No

Blount

Percent of map unit: 2 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Matherton

Percent of map unit: 1 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

46—Wallkill silt loam

Map Unit Setting

National map unit symbol: 6b9t
Elevation: 580 to 1,400 feet
Mean annual precipitation: 28 to 45 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wallkill and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wallkill

Setting

Landform: Depressions on moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over organic material

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 34 inches: silt loam
Oa - 34 to 60 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Occasional
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 16.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

Minor Components

Wolcott

Percent of map unit: 1 percent
Landform: Depressions on moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Houghton

Percent of map unit: 1 percent
Landform: Depressions on moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Pewamo

Percent of map unit: 1 percent
Landform: Depressions on moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

50C—Coloma sand, 6 to 18 percent slopes

Map Unit Setting

National map unit symbol: 6b9w
Elevation: 580 to 1,360 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Coloma and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Coloma

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: sand
H2 - 9 to 35 inches: sand
H3 - 35 to 60 inches: stratified sand to sandy loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Minor Components

Thetford

Percent of map unit: 3 percent
Landform: Moraines on swales
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA019MI - Moist Sandy Drift Plains
Hydric soil rating: No

Morley

Percent of map unit: 2 percent
Landform: Moraines
Landform position (two-dimensional): Summit, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Miami

Percent of map unit: 2 percent
Landform: Moraines
Landform position (two-dimensional): Summit, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

55—Pits, gravel

Map Unit Composition

Gravel pits: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gravel Pits

Setting

Landform: Outwash plains, kames
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

HgtahA—Houghton muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2zdlc
Elevation: 720 to 1,100 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Houghton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton

Setting

Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 80 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 3 percent
Maximum salinity: Nonsaline to very slightly saline (0.4 to 2.7 mmhos/cm)
Sodium adsorption ratio, maximum: 0.8
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R098XA002MI - Inland Salt Marshes, F098XA006MI - Mucky Depressions

Hydric soil rating: Yes

Minor Components

Adrian

Percent of map unit: 4 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Edwards

Percent of map unit: 3 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Palms

Percent of map unit: 2 percent
Landform: Depressions on moraines, swamps on moraines, drainageways on till plains, drainageways on moraines, drainageways on outwash plains, depressions on outwash plains, depressions on till plains, swamps on outwash plains, swamps on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Gilford, gravelly subsoil

Percent of map unit: 1 percent
Landform: Glacial drainage channels, glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA020MI - Wet Sandy Drift Depressions
Hydric soil rating: Yes

W—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Lenawee County, Michigan

BaA—Barry sandy loam, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b28
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Barry and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Barry

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: sandy loam
H2 - 12 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BbA—Berrien loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b29
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BbB—Berrien loamy sand, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2b
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BcA—Berrien sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2d
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

BcB—Berrien sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2f
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

BcC—Berrien sandy loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b2h
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BdA—Berville loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2j
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Berville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berville

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 24 inches: sandy loam
H3 - 24 to 36 inches: loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BeA—Berville sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2k
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Berville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berville

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 10 inches: sandy loam
H2 - 10 to 24 inches: sandy loam
H3 - 24 to 36 inches: loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BfA2—Blount loam, 0 to 3 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b2m
Elevation: 580 to 1,530 feet
Mean annual precipitation: 29 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount, Moderately Eroded

Setting

Landform: Knolls, till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 10 inches: silty clay loam
H3 - 10 to 26 inches: silty clay loam
H4 - 26 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 5 percent
Landform: Depressions, till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BgA—Blount loam and Pewamo clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2q
Elevation: 580 to 1,530 feet
Mean annual precipitation: 29 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 60 percent
Pewamo and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 10 inches: silty clay loam
H3 - 10 to 26 inches: silty clay loam
H4 - 26 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Description of Pewamo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 16 inches: clay loam
H2 - 16 to 32 inches: silty clay loam
H3 - 32 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BhA—Brady sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2r
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches

Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Knolls on strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 5 percent
Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BkA—Brady and Macomb loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2s
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 46 percent
Macomb and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Macomb

Setting

Landform: Knolls on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 32 inches: loam
H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 10 percent
Landform: Strand plains, depressions
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BmA—Brady and Macomb sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2t

Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 46 percent
Macomb and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Macomb

Setting

Landform: Knolls on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam

H2 - 11 to 32 inches: loam
H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BnA—Bronson sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2v
Elevation: 500 to 1,200 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Bronson and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bronson

Setting

Landform: Knolls on strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 38 inches: sandy loam
H3 - 38 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Brookston

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BnB—Bronson sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2w

Elevation: 500 to 1,200 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Bronson and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bronson

Setting

Landform: Knolls on strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 38 inches: sandy loam
H3 - 38 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Brookston

Percent of map unit: 5 percent
Landform: Depressions on moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BntaaA—Blount loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wp2k
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, concave
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 30 inches: silty clay
BC - 30 to 37 inches: clay loam
Cd - 37 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 28 to 48 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge

Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 6 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Conover

Percent of map unit: 4 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Glynwood

Percent of map unit: 3 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Badaxe

Percent of map unit: 2 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

BntaaB—Blount loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2wp2l
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days

Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: End moraines, ground moraines
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 28 inches: silty clay
BC - 28 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 26 to 45 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Glynwood, eroded

Percent of map unit: 8 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Conover

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Depressions on end moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Badaxe

Percent of map unit: 2 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, convex
Across-slope shape: Linear
Hydric soil rating: No

BntabB—Blount loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wp2m
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount, eroded, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount, Eroded

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 7 inches: loam
Bt - 7 to 24 inches: silty clay
BC - 24 to 30 inches: clay loam
Cd - 30 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 24 to 40 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Glynwood, eroded

Percent of map unit: 8 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Conover

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Depressions, end moraines
Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Badaxe

Percent of map unit: 2 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, convex
Across-slope shape: Linear
Hydric soil rating: No

BoA—Brookston loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2x
Elevation: 500 to 1,020 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Brookston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brookston

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 23 inches: clay loam
H3 - 23 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches

Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BpA—Brookston loam, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2y
Elevation: 600 to 900 feet
Mean annual precipitation: 35 to 40 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 150 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Brookston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brookston

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 18 inches: clay loam
H3 - 18 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 11.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

CaB—Cadmus loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2z
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C

Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CaB2—Cadmus loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b30
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CarabA—Carlisle muck, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2zdk5
Elevation: 740 to 990 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Carlisle and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carlisle

Setting

Landform: Depressions on moraines, depressions on glacial drainage channels, depressions on outwash plains, depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Woody organic material

Typical profile

Oa1 - 0 to 13 inches: muck
Oa2 - 13 to 37 inches: muck
Oa3 - 37 to 80 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 0.6
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Linwood

Percent of map unit: 4 percent
Landform: Depressions on moraines, depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Wallkill

Percent of map unit: 4 percent
Landform: Depressions on glacial drainage channels, depressions on moraines, depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Adrian

Percent of map unit: 2 percent
Landform: Depressions on moraines, drainageways on moraines, drainageways on glacial drainage channels, drainageways on outwash plains, depressions on outwash plains, depressions on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

CaracA—Carlisle muck, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2zdl1
Elevation: 700 to 850 feet
Mean annual precipitation: 35 to 41 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Carlisle and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carlisle

Setting

Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material and/or woody organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 79 inches: woody muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very high (about 24.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Minor Components

Linwood

Percent of map unit: 9 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

Pewamo

Percent of map unit: 6 percent
Landform: Depressions on moraines, drainageways on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression

Hydric soil rating: Yes

CbA—Cadmus sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b31
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

CbB—Cadmus sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b32
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CcA—Cadmus and Blount loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b34
Elevation: 580 to 1,530 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Cadmus and similar soils: 46 percent
Blount and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Description of Blount

Setting

Landform: Knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 10 inches: silty clay loam
H3 - 10 to 26 inches: silty clay loam
H4 - 26 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 10 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

CeA—Colwood very fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b36
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Colwood and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: very fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

CfA—Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b37
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Colwood and similar soils: 51 percent
Wauseon and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Wauseon

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

CgA—Conover loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b38
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Colwood

Percent of map unit: 5 percent
Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

CgB—Conover loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b39
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches

Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Colwood

Percent of map unit: 5 percent
Landform: Knolls on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

Co—Colwood loam

Map Unit Setting

National map unit symbol: 68tz
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Colwood and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colwood

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 45 inches: clay loam
H3 - 45 to 60 inches: stratified very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 11.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Metamora

Percent of map unit: 5 percent
Landform: Knolls on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Cr—Corunna sandy loam

Map Unit Setting

National map unit symbol: 68tt
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Corunna and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Corunna

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent

Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Metamora

Percent of map unit: 5 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Selfridge

Percent of map unit: 5 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Belleville

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY011MI - Warm Wet Sandy Depression
Hydric soil rating: Yes

Cs—Ceresco fine sandy loam

Map Unit Setting

National map unit symbol: 68vf
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Ceresco and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ceresco

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 18 inches: fine sandy loam
H2 - 18 to 34 inches: fine sandy loam
H3 - 34 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F099XY008MI - Moist Floodplain
Hydric soil rating: No

EaA—Edwards muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b3c
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Edwards and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Edwards

Setting

Landform: Depressions on till-floored lake plains

Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over marl

Typical profile

Oa - 0 to 24 inches: muck
Lma - 24 to 60 inches: marly material

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 90 percent
Available water supply, 0 to 60 inches: Very high (about 14.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: R111XB002IN - Limnic Muck
Hydric soil rating: Yes

FbA—Fox loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b3h
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FbB—Fox loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b3j
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 32 inches: clay loam

H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FbC—Fox loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b3k
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 32 inches: clay loam

H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FbC2—Fox loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b3l
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 32 inches: clay loam

H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FcA—Fox sandy loam, till plain, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wvh4
Elevation: 650 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Outwash plains, outwash terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest, tread
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loamy glaciofluvial deposits over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified sand to gravel

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: R111XC010IN - Well Drained Overflow, F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB403IN - Outwash Upland
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

FcB—Fox sandy loam, till plain, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2wvh5
Elevation: 650 to 1,250 feet

Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Outwash plains, outwash terraces
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest, tread
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loamy glaciofluvial deposits over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified sand to gravel

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave

Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

FcB2—Fox sandy loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b3p
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: sandy loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FcC—Fox sandy loam, Huron Lobe, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2wvh6
Elevation: 660 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Moraines, outwash plains, ice-contact slopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Loamy till over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified gravelly sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

FcC2—Fox sandy loam, Huron Lobe, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvh7
Elevation: 660 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox, eroded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Eroded

Setting

Landform: Ice-contact slopes, outwash plains, moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Loamy till over sandy and gravelly outwash

Typical profile

Ap - 0 to 8 inches: sandy loam
Bt1 - 8 to 26 inches: sandy clay loam
Bt2 - 26 to 31 inches: gravelly loam
2C - 31 to 79 inches: stratified gravelly sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R111XC010IN - Well Drained Overflow, F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB403IN - Outwash Upland
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope

Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

FcD2—Fox sandy loam, 12 to 25 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b3t
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Fox, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Moderately Eroded

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: sandy loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

FcE—Fox sandy loam, 25+ percent slopes

Map Unit Setting

National map unit symbol: 6b3v
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Fox and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: sandy loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 25 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

FdD3—Fox soils, 12 to 25 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 6b3x
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Fox, severely eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Severely Eroded

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: clay loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

GaA—Genesee loam, 0 to 2 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: 2z6cv
Elevation: 340 to 1,280 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee, occasionally flooded, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee, Occasionally Flooded

Setting

Landform: Flood-plain steps, natural levees
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

Ap - 0 to 8 inches: loam
Bw - 8 to 32 inches: loam
C - 32 to 79 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 30 to 33 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

Minor Components

Eel, frequently flooded
Percent of map unit: 8 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Sloan, occassionally ponded
Percent of map unit: 7 percent
Landform: Depressions, flood-plain steps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Shoals, occasionally flooded
Percent of map unit: 5 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

GbA—Genesee sandy loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b41
Elevation: 580 to 900 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Genesee and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee

Setting
Landform: Knolls on flood plains
Landform position (three-dimensional): Rise

Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F099XY008MI - Moist Floodplain
Hydric soil rating: No

GcA—Genesee and Eel loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b43
Elevation: 340 to 900 feet
Mean annual precipitation: 30 to 46 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 120 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee and similar soils: 51 percent
Eel and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

Description of Eel

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: loam
H3 - 20 to 60 inches: stratified sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F111XB204IN - Dry Alluvium Forest

Hydric soil rating: No

GdA—Granby loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b44
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Granby and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Granby

Setting

Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciofluvial deposits and/or sandy glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: loamy sand
H2 - 8 to 36 inches: fine sand
H3 - 36 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

GeA—Granby sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b45
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Granby and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Granby

Setting

Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciofluvial deposits and/or sandy glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: fine sand
H3 - 36 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

GfA—Griffin and Genesee loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b46
Elevation: 580 to 1,000 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Genesee and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

GgA—Griffin and Sloan loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b47
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Sloan and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Sloan

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 22 inches: clay loam
H3 - 22 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Occasional

Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

GhA—Griffin and Sloan sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b48
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Sloan and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None

Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Sloan

Setting
Landform: Depressions on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile
H1 - 0 to 15 inches: loam
H2 - 15 to 22 inches: clay loam
H3 - 22 to 60 inches: loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

Gp—Gravel pits

Map Unit Composition
Gravel pits: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

HaB—Hillsdale sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b49
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Hillsdale and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hillsdale

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 16 inches: sandy loam
H3 - 16 to 48 inches: sandy loam
H4 - 48 to 60 inches: sandy loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

HaC2—Hillsdale sandy loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b4b
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Hillsdale, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hillsdale, Moderately Eroded

Setting

Landform: Ridges on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 16 inches: sandy loam
H3 - 16 to 48 inches: sandy loam
H4 - 48 to 60 inches: sandy loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

HcA—Hoytville clay loam and silty clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4d
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silty clay loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

HfA—Hoytville and Wauseon loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4h
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 51 percent
Wauseon and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Wauseon

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

HgtahA—Houghton muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2zdlc
Elevation: 720 to 1,100 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Houghton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton

Setting

Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 80 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 3 percent
Maximum salinity: Nonsaline to very slightly saline (0.4 to 2.7 mmhos/cm)
Sodium adsorption ratio, maximum: 0.8
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R098XA002MI - Inland Salt Marshes, F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Adrian

Percent of map unit: 4 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Edwards

Percent of map unit: 3 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Palms

Percent of map unit: 2 percent
Landform: Depressions on moraines, swamps on moraines, drainageways on till plains, drainageways on moraines, drainageways on outwash plains, depressions on outwash plains, depressions on till plains, swamps on outwash plains, swamps on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Gilford, gravelly subsoil

Percent of map unit: 1 percent
Landform: Glacial drainage channels, glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA020MI - Wet Sandy Drift Depressions
Hydric soil rating: Yes

HgtaiA—Houghton muck, Erie-Huron lake plain, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2zdk6
Elevation: 630 to 820 feet
Mean annual precipitation: 30 to 37 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 185 days
Farmland classification: Farmland of local importance

Map Unit Composition

Houghton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton

Setting

Landform: Depressions on outwash plains, depressions on moraines on outwash plains

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 80 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 3 percent
Maximum salinity: Nonsaline to very slightly saline (0.4 to 2.7 mmhos/cm)
Sodium adsorption ratio, maximum: 0.8
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F099XY014MI - Mucky Depression
Hydric soil rating: Yes

Minor Components

Adrian

Percent of map unit: 4 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F099XY014MI - Mucky Depression
Hydric soil rating: Yes

Edwards

Percent of map unit: 3 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F099XY014MI - Mucky Depression
Hydric soil rating: Yes

Palms

Percent of map unit: 2 percent
Landform: Drainageways on moraines, drainageways on outwash plains, depressions on outwash plains, depressions on till plains, swamps on outwash plains, swamps on till plains, depressions on moraines, swamps on moraines, drainageways on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F099XY014MI - Mucky Depression
Hydric soil rating: Yes

Gilford, gravelly subsoil

Percent of map unit: 1 percent
Landform: Glacial drainage channels, glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA020MI - Wet Sandy Drift Depressions, F099XY012MI - Cool Wet Sandy Depression
Hydric soil rating: Yes

HgtanA—Houghton muck, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 30n5d
Elevation: 650 to 1,070 feet
Mean annual precipitation: 35 to 41 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Houghton, undrained, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton, Undrained

Setting

Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 79 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very high (about 24.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Minor Components

Palms, undrained

Percent of map unit: 8 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

Muskego, undrained

Percent of map unit: 7 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB002IN - Limnic Muck
Hydric soil rating: Yes

IaA—Ionia loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4j
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ionia and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ionia

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

IaB—Ionia loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b4k
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ionia and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ionia

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

KaC—Kendallville loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b4l
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

KaC2—Kendallville loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b4m
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

KbC—Kendallville sandy loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b4n
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

KcC2—Kendallville soils, 7 to 15 percent slopes, moderately or severely eroded

Map Unit Setting

National map unit symbol: 6b4p
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: clay loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge

Hydric soil rating: No

KdA—Kerston muck and loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4q
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Kerston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kerston

Setting

Landform: Depressions on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over alternating layers of alluvium and/or organic material

Typical profile

Oa1 - 0 to 8 inches: muck
Oa2 - 8 to 15 inches: muck
H3 - 15 to 42 inches: stratified fine sand to silty clay loam
O'a - 42 to 50 inches: muck
H5 - 50 to 60 inches: stratified fine sand to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 14.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

KeA—Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4r
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Kibbie and similar soils: 51 percent
Colwood and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kibbie

Setting

Landform: Knolls on deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

KfA—Kokomo and Barry loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4t
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Kokomo and similar soils: 51 percent
Barry and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kokomo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 31 inches: silty clay loam
H3 - 31 to 60 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Barry

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None

Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

KgA—Kokomo, Barry, and Wallkill loams, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4v
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kokomo and similar soils: 40 percent
Barry and similar soils: 30 percent
Wallkill and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kokomo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 31 inches: silty clay loam
H3 - 31 to 60 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None

Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Barry

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Wallkill

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over organic material

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: fine sandy loam
Oa - 20 to 60 inches: muck

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 19.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

LaA—Lake borders

Map Unit Composition

Lake borders: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lake Borders

Setting

Landform: Beaches

LcA—Linwood muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4y
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 32 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Linwood and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Linwood

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Woody organic material over loamy till

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 31 inches: muck
H3 - 31 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 17.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

Le—Lenawee silty clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2wcf7
Elevation: 560 to 980 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 230 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Lenawee and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lenawee

Setting

Landform: Lakebeds (relict)
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey glaciolacustrine deposits

Typical profile

Ap - 0 to 9 inches: silty clay loam
Bg - 9 to 39 inches: silty clay loam
Cg - 39 to 80 inches: silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 21 percent
Maximum salinity: Nonsaline (0.0 to 0.6 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Del rey

Percent of map unit: 7 percent
Landform: Lakebeds (relict)
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Linear, convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

MaA—Macomb fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b50
Elevation: 600 to 1,000 feet

Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Macomb and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Macomb

Setting
Landform: Drainageways on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile
H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 32 inches: sandy clay loam
H3 - 32 to 60 inches: loam

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

MbA—Macomb sandy clay loam and Hoytville clay loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b51
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 160 days

Farmland classification: Prime farmland if drained

Map Unit Composition

Macomb and similar soils: 51 percent
Hoytville and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Macomb

Setting

Landform: Drainageways on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 32 inches: sandy clay loam
H3 - 32 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

MdA—Miami loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b53
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 141 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Miami and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

MeD—Miami loam and Boyer sandy loam, 12 to 25 percent slopes

Map Unit Setting
National map unit symbol: 6b59
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Miami and similar soils: 51 percent
Boyer and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami

Setting
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile
H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities
Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Description of Boyer

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

MeD2—Miami loam and Boyer sandy loam, 12 to 25 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b5b
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Miami, moderately eroded, and similar soils: 60 percent
Boyer, moderately eroded, and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami, Moderately Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C

Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Description of Boyer, Moderately Eroded

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

MfD3—Miami soils, 15 to 25 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 6b5f
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 141 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Miami, severely eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami, Severely Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: clay loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

MhA—Morley loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b5j
Elevation: 580 to 1,400 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Morley and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhB—Glynwood loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2v4bq
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 31 inches: clay
BC - 31 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 28 to 45 inches to densic material
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge

Hydric soil rating: No

Minor Components

Rawson

Percent of map unit: 6 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhB2—Glynwood loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2v4br
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 7 inches: loam
Bt - 7 to 26 inches: clay
BC - 26 to 30 inches: clay loam
Cd - 30 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 25 to 37 inches to densic material
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Rawson

Percent of map unit: 6 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhC—Morley loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2wp25
Elevation: 570 to 1,120 feet
Mean annual precipitation: 32 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till

Typical profile

Ap - 0 to 9 inches: loam
Bt1 - 9 to 18 inches: clay
Bt2 - 18 to 29 inches: clay
BC - 29 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 26 to 40 inches to densic material
Drainage class: Well drained
Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood

Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhC2—Morley loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wp26
Elevation: 750 to 1,220 feet
Mean annual precipitation: 32 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 165 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 17 inches: clay
Bt2 - 17 to 28 inches: clay
BC - 28 to 33 inches: clay loam
Cd - 33 to 79 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 24 to 38 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C

Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood
Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount
Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo
Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhD—Morley loam, 12 to 25 percent slopes

Map Unit Setting
National map unit symbol: 6b5p
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Morley and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MhD2—Morley loam, 12 to 25 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b5q
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Moderately Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MhE—Morley loam, 25+ percent slopes

Map Unit Setting

National map unit symbol: 6b5r
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MkB3—Glynwood clay loam, 2 to 6 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 2t6ln
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Glynwood, severely eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood, Severely Eroded

Setting

Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 6 inches: clay loam
Bt - 6 to 20 inches: clay
BC - 20 to 25 inches: clay loam
Cd - 25 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 36 inches to densic material
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Rawson, severely eroded

Percent of map unit: 6 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MkC3—Morley soils, 7 to 15 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 6b5t
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley, severely eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Severely Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MkD3—Morley clay loam, 12 to 18 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 2wvhl
Elevation: 720 to 1,120 feet
Mean annual precipitation: 35 to 40 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 160 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley, severely eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Severely Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 7 inches: clay loam
Bt - 7 to 25 inches: clay
BC - 25 to 33 inches: clay loam
Cd - 33 to 79 inches: clay loam

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: 26 to 45 inches to densic material
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hennepin, severely eroded

Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Glynwood, severely eroded

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

MkE2—Morley soils, 25+ percent slopes, moderately or severely eroded

Map Unit Setting

National map unit symbol: 6b5w
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches

Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Morley, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Moderately Eroded

Setting
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile
H1 - 0 to 7 inches: clay loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities
Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MmA—Metamora sandy loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 68ts
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F

Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Metamora and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Metamora

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 21 inches: sandy loam
H3 - 21 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Blount

Percent of map unit: 4 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Selfridge

Percent of map unit: 4 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise

Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Corunna

Percent of map unit: 4 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Pewamo

Percent of map unit: 3 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

MnA—Metamora-Corunna sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 68tl
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Metamora and similar soils: 45 percent
Corunna and similar soils: 30 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Metamora

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 21 inches: sandy loam

H3 - 21 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Corunna

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Selfridge

Percent of map unit: 12 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Belleville

Percent of map unit: 7 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY011MI - Warm Wet Sandy Depression
Hydric soil rating: Yes

Brookston

Percent of map unit: 6 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

NaA—Nappanee silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b5x
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise

Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

NaB—Nappanee silt loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b5y
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

NaB2—Nappanee silt loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b5z
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee, Moderately Eroded

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

NbB—Nappanee loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b60
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

NbB2—Nappanee loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b61
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee, Moderately Eroded

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

OaA—Ogden muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b62
Elevation: 600 to 1,500 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Ogden and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ogden

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Dip

Down-slope shape: Linear
Across-slope shape: Linear

Typical profile
Oa - 0 to 30 inches: muck
H2 - 30 to 60 inches: silty clay

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Very high (about 16.2 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

ObA—Oshtemo loamy sand, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b63
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition
Oshtemo and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oshtemo

Setting
Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy and/or sandy glaciofluvial deposits

Typical profile
H1 - 0 to 14 inches: loamy sand
H2 - 14 to 45 inches: sandy loam

H3 - 45 to 60 inches: stratified sand to gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

ObB—Oshtemo loamy sand, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b64
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Oshtemo and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oshtemo

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy and/or sandy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: loamy sand
H2 - 14 to 45 inches: sandy loam
H3 - 45 to 60 inches: stratified gravelly sand to sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

ObC—Oshtemo loamy sand, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b66
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Oshtemo and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oshtemo

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy and/or sandy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: loamy sand
H2 - 14 to 45 inches: sandy loam
H3 - 45 to 60 inches: stratified gravelly sand to sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained

Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups
Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

OcC—Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded

Map Unit Setting
National map unit symbol: 6b67
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition
Ottawa and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ottawa

Setting
Landform: Beaches on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Glaciofluvial deposits and/or sandy glaciolacustrine deposits over loamy till

Typical profile
H1 - 0 to 35 inches: loamy sand
H2 - 35 to 50 inches: fine sand
H3 - 50 to 60 inches: loam

Properties and qualities
Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

OkB—Oakville fine sand, loamy substratum, 0 to 6 percent slopes

Map Unit Setting
National map unit symbol: 68vj
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition
Oakville, loamy substratum, and similar soils: 88 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oakville, Loamy Substratum

Setting
Landform: Outwash deltas on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy eolian deposits over loamy till

Typical profile
H1 - 0 to 9 inches: fine sand
H2 - 9 to 52 inches: fine sand
H3 - 52 to 60 inches: clay loam

Properties and qualities
Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None

Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Tedrow

Percent of map unit: 6 percent
Landform: Outwash deltas, knolls
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Thetford

Percent of map unit: 6 percent
Landform: Outwash deltas, knolls
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

OsB—Ottokee variant fine sand, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 68v5
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Ottokee and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ottokee

Setting

Landform: Knolls on outwash deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear

Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile
H1 - 0 to 9 inches: fine sand
H2 - 9 to 24 inches: fine sand
H3 - 24 to 28 inches: loamy sand
R - 28 to 32 inches: bedrock

Properties and qualities
Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 24 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.6 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Oakville
Percent of map unit: 7 percent
Landform: Knolls on outwash deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

PaA—Palms muck, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b68
Elevation: 250 to 1,500 feet
Mean annual precipitation: 30 to 45 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition
Palms and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Palms

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material and/or loamy till

Typical profile

Oa1 - 0 to 13 inches: muck
Oa2 - 13 to 32 inches: muck
H3 - 32 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Very high (about 17.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

PbA—Pewamo clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t6lz
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 205 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on till plains, drainageways on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 11 inches: clay loam
Btg1 - 11 to 34 inches: clay
Btg2 - 34 to 47 inches: clay loam
BCg - 47 to 57 inches: clay loam
Cg - 57 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 8 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Brookston

Percent of map unit: 4 percent
Landform: Drainageways on till plains, depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave

Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Palms, undrained

Percent of map unit: 3 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

PcA—Pewamo mucky clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6b
Elevation: 600 to 1,400 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Pewamo and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: mucky silty clay loam
H2 - 7 to 32 inches: clay loam
H3 - 32 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None

Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

PdA—Plainfield and Berrien loamy sands, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6c
Elevation: 600 to 1,150 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 51 percent
Berrien and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

PdB—Plainfield and Berrien loamy sands, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b6d
Elevation: 600 to 1,150 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 51 percent
Berrien and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

PeB—Plainfield and Ottawa loamy sands, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b6g
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups
Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PeB2—Plainfield and Ottawa loamy sands, 3 to 7 percent slopes, moderately eroded

Map Unit Setting
National map unit symbol: 6b6h
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition
Plainfield, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield, Moderately Eroded

Setting
Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile
H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities
Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups
Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PeC—Plainfield and Ottawa loamy sands, 7 to 15 percent slopes

Map Unit Setting
National map unit symbol: 6b6j
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition
Plainfield and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting
Landform: Beach ridges
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile
H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities
Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PeC2—Plainfield and Ottawa loamy sands, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6k
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield, Moderately Eroded

Setting

Landform: Beach ridges
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PwmaaA—Pewamo clay loam, dense substratum, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2qz3f
Elevation: 670 to 830 feet
Mean annual precipitation: 31 to 36 inches
Mean annual air temperature: 47 to 49 degrees F
Frost-free period: 143 to 182 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo, dense substratum, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo, Dense Substratum

Setting

Landform: Drainageways on nearshore zones (relict), flats on nearshore zones (relict)
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over dense till

Typical profile

Ap - 0 to 11 inches: clay loam
Btg - 11 to 39 inches: clay loam
BCg - 39 to 56 inches: clay loam
2Cd - 56 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 30 to 70 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Metamora, dense substratum

Percent of map unit: 12 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Blount

Percent of map unit: 4 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Gilford, loamy substratum

Percent of map unit: 2 percent
Landform: Drainageways on nearshore zones (relict), depressions on nearshore zones (relict)
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Selfridge, dense substratum

Percent of map unit: 2 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

RaA—Rifle peat, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6l

Elevation: 810 to 850 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 130 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition
Rifle and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rifle

Setting
Landform: Depressions on till plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Woody organic material

Typical profile
Oa - 0 to 14 inches: muck
Oe - 14 to 60 inches: mucky peat

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

RbA—Rollin muck, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b6m
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Rollin and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rollin

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over marl

Typical profile

Oa - 0 to 30 inches: muck
Lma - 30 to 60 inches: marly material

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 90 percent
Available water supply, 0 to 60 inches: Very high (about 15.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

SbA—Sebewa sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6p
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Sebewa and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sebewa

Setting

Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 30 inches: sandy clay loam
H3 - 30 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

ScB—Spinks, Boyer, Plainfield, and Hillsdale soils, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b6q
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Spinks and similar soils: 51 percent
Hillsdale and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Spinks

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loamy sand
H2 - 7 to 20 inches: loamy sand
H3 - 20 to 50 inches: fine sand
H4 - 50 to 60 inches: fine sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Description of Hillsdale

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 16 inches: sandy loam
H3 - 16 to 48 inches: sandy loam
H4 - 48 to 60 inches: sandy loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

ScB2—Spinks, Boyer, Plainfield, and Hillsdale soils, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6r
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Spinks, moderately eroded, and similar soils: 51 percent
Hillsdale, moderately eroded, and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Spinks, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loamy sand
H2 - 7 to 20 inches: loamy sand
H3 - 20 to 50 inches: fine sand
H4 - 50 to 60 inches: fine sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Description of Hillsdale, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 16 inches: sandy loam
H3 - 16 to 48 inches: sandy loam
H4 - 48 to 60 inches: sandy loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

ScC—Spinks, Boyer, Plainfield, and Hillsdale soils, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b6s

Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Spinks and similar soils: 51 percent
Hillsdale and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Spinks

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loamy sand
H2 - 7 to 20 inches: loamy sand
H3 - 20 to 50 inches: fine sand
H4 - 50 to 60 inches: fine sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Description of Hillsdale

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear

Across-slope shape: Convex
Parent material: Loamy supraglacial till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 16 inches: sandy loam
H3 - 16 to 48 inches: sandy loam
H4 - 48 to 60 inches: sandy loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

ScC2—Spinks, Boyer, Plainfield, and Hillsdale soils, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6t
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Spinks, moderately eroded, and similar soils: 51 percent
Hillsdale, moderately eroded, and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Spinks, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loamy sand
H2 - 7 to 20 inches: loamy sand
H3 - 20 to 50 inches: fine sand
H4 - 50 to 60 inches: fine sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Description of Hillsdale, Moderately Eroded

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 16 inches: sandy loam
H3 - 16 to 48 inches: sandy loam
H4 - 48 to 60 inches: sandy loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

ScD2—Spinks, Boyer, Plainfield, and Hillsdale soils, 12 to 25 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6v
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Spinks, moderately eroded, and similar soils: 51 percent
Hillsdale, moderately eroded, and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Spinks, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loamy sand
H2 - 7 to 20 inches: loamy sand
H3 - 20 to 50 inches: fine sand
H4 - 50 to 60 inches: fine sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Description of Hillsdale, Moderately Eroded

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy supraglacial till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 16 inches: sandy loam
H3 - 16 to 48 inches: sandy loam
H4 - 48 to 60 inches: sandy loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

SdC—St. Clair loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b6w
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

St. clair and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F099XY007MI - Lake Plain Flats

Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

SdC2—St. Clair loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6x
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

St. clair, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair, Moderately Eroded

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

SdD2—St. Clair loam, 12 to 25 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6y
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

St. clair, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair, Moderately Eroded

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest

Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

SdE—St. Clair loam, 25+ percent slopes

Map Unit Setting

National map unit symbol: 6b6z
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

St. clair and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

SdE2—St. Clair loam, 25+ percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b70
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

St. clair, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair, Moderately Eroded

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge

Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

SeC3—St. Clair soils, 7 to 15 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 6b71
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

St. clair, severely eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair, Severely Eroded

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: clay loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

Sf—Sebewa loam, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2v4bw
Elevation: 570 to 1,070 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 110 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Sebewa and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sebewa

Setting

Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave

Parent material: Loamy drift over sandy and gravelly outwash

Typical profile

Ap - 0 to 11 inches: loam
Btg1 - 11 to 21 inches: clay loam
Btg2 - 21 to 33 inches: clay loam
2Cg - 33 to 79 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 23 to 39 inches to strongly contrasting textural stratification
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 45 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 3.0
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways, drainageways on stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Gilford

Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

ShA—Selfridge-Pewamo complex, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 68tp
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Selfridge and similar soils: 50 percent
Pewamo and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Selfridge

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 8 inches: loamy sand
H2 - 8 to 25 inches: sand
H3 - 25 to 29 inches: sandy loam
H4 - 29 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Description of Pewamo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 12 inches: clay loam
H2 - 12 to 35 inches: clay loam
H3 - 35 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Metamora

Percent of map unit: 10 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

SI—Sloan loam

Map Unit Setting

National map unit symbol: 68v0

Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Sloan and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sloan

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 26 inches: silt loam
H3 - 26 to 60 inches: stratified silt loam to sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F099XY009MI - Wet Floodplain
Hydric soil rating: Yes

Minor Components

Ceresco

Percent of map unit: 10 percent
Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY008MI - Moist Floodplain
Hydric soil rating: No

TaA—Tawas muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b72
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Tawas and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tawas

Setting

Landform: Depressions on strand plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Woody organic material over sandy glaciofluvial deposits

Typical profile

Oa - 0 to 28 inches: muck
H2 - 28 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Very high (about 13.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

Ud—Udorthents, nearly level and undulating

Map Unit Setting

National map unit symbol: 1bxsy
Elevation: 580 to 1,110 feet
Mean annual precipitation: 27 to 32 inches
Mean annual air temperature: 43 to 46 degrees F
Frost-free period: 95 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Landform: Moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 80 inches: silty clay loam

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Hydrologic Soil Group: C
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

WaA—Wallkill loam, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b73
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Wallkill and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wallkill

Setting

Landform: Depressions on flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over organic material

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: fine sandy loam
Oa - 20 to 60 inches: muck

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 19.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

WawabB—Wawasee loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2wp1x
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 9 inches: loam
Bt1 - 9 to 24 inches: loam
Bt2 - 24 to 33 inches: clay loam
C - 33 to 79 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier
Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston
Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawabC—Wawasee loam, 6 to 12 percent slopes

Map Unit Setting
National map unit symbol: 2wvgl
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition
Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 24 inches: loam
Bt2 - 24 to 33 inches: clay loam
C - 33 to 79 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawacB—Wawasee loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvgk
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 24 inches: loam
Bt2 - 24 to 32 inches: clay loam
C - 32 to 79 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains

Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawacC—Wawasee loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvgm
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 7 inches: loam

Bt1 - 7 to 23 inches: loam
Bt2 - 23 to 31 inches: clay loam
C - 31 to 79 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawadD—Wawasee loam, 12 to 25 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvgr

Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Wawasee and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 7 inches: loam
Bt1 - 7 to 23 inches: loam
Bt2 - 23 to 31 inches: clay loam
C - 31 to 79 inches: loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 6 percent
Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 4 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WbA—Warners muck and marl, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b74
Elevation: 50 to 1,200 feet
Mean annual precipitation: 28 to 45 inches
Mean annual air temperature: 39 to 54 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Warners and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Warners

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium over marl

Typical profile

Oa - 0 to 10 inches: muck
Lma - 10 to 60 inches: marly material

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 90 percent

Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

WcA—Wauseon loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b75
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Wauseon and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wauseon

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

WdA—Willette muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b76
Elevation: 600 to 1,500 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Willette and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Willette

Setting

Landform: Depressions, depressions
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Organic material over loamy till and/or lacustrine deposits

Typical profile

Oa - 0 to 30 inches: muck
H2 - 30 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Very high (about 16.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

ZfsacA—Ziegenfuss clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2qz3g
Elevation: 570 to 790 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Ziegenfuss and similar soils: 86 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ziegenfuss

Setting

Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over loamy till

Typical profile

Ap - 0 to 9 inches: clay loam
Bg - 9 to 30 inches: clay loam
BC - 30 to 40 inches: clay loam
C - 40 to 67 inches: clay loam
2Cd - 67 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 60 to 80 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 28 percent
Maximum salinity: Nonsaline (0.1 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 9 percent
Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Houcktown

Percent of map unit: 5 percent
Landform: Wave-worked till plains
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Monroe County, Michigan

13A—Blount loam, Erie-Huron Lake Plain, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wb29
Elevation: 540 to 850 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Wave-worked till plains, nearshore zones (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Moderately fine-textured lodgment till

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 27 inches: clay
BC - 27 to 37 inches: clay loam
Cd - 37 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 19 to 49 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 7 percent
Landform: Wave-worked till plains, nearshore zones (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Microfeatures of landform position: Open depressions
Down-slope shape: Linear, concave
Across-slope shape: Concave, linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Metamora

Percent of map unit: 5 percent
Landform: Wave-worked till plains, nearshore zones (relict)
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Linear, convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Selfridge

Percent of map unit: 3 percent
Landform: Wave-worked till plains, nearshore zones (relict)
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Microfeatures of landform position: Rises
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

17A—Metamora-Corunna sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 68tl
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Metamora and similar soils: 45 percent
Corunna and similar soils: 30 percent
Minor components: 25 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Metamora

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 21 inches: sandy loam
H3 - 21 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Corunna

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches

Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Selfridge

Percent of map unit: 12 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Belleville

Percent of map unit: 7 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY011MI - Warm Wet Sandy Depression
Hydric soil rating: Yes

Brookston

Percent of map unit: 6 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

19A—Selfridge loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2whvw
Elevation: 540 to 830 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Selfridge and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Selfridge

Setting

Landform: Wave-worked till plains, nearshore zones (relict), water-lain moraines, glacial drainage channels, deltas
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Parent material: Sandy and loamy glaciolacustrine deposits over loamy till

Typical profile

Ap - 0 to 9 inches: loamy sand
E - 9 to 17 inches: sand
Bw - 17 to 27 inches: sand
Bt1 - 27 to 30 inches: sandy loam
2Bt2 - 30 to 35 inches: clay loam
2Cg - 35 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY005MI - Cool Moist Sandy Depression
Hydric soil rating: No

Minor Components

Belleville

Percent of map unit: 5 percent
Landform: Nearshore zones (relict), wave-worked till plains, water-lain moraines, glacial drainage channels, deltas
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Microfeatures of landform position: Open depressions
Down-slope shape: Linear, concave

Across-slope shape: Concave
Ecological site: F099XY012MI - Cool Wet Sandy Depression
Hydric soil rating: Yes

Parkhill

Percent of map unit: 3 percent
Landform: Wave-worked till plains, deltas, glacial drainage channels, water-lain moraines, nearshore zones (relict)
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Microfeatures of landform position: Open depressions
Down-slope shape: Linear, concave
Across-slope shape: Concave
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Capac

Percent of map unit: 2 percent
Landform: Nearshore zones (relict), wave-worked till plains, water-lain moraines, glacial drainage channels, deltas
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

20A—Selfridge-Pewamo complex, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 68tp
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Selfridge and similar soils: 50 percent
Pewamo and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Selfridge

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Parent material: Sandy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 8 inches: loamy sand
H2 - 8 to 25 inches: sand
H3 - 25 to 29 inches: sandy loam
H4 - 29 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Description of Pewamo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 12 inches: clay loam
H2 - 12 to 35 inches: clay loam
H3 - 35 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Metamora
Percent of map unit: 10 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

21—Lenawee silty clay loam, 0 to 1 percent slopes

Map Unit Setting
National map unit symbol: 2wcf7
Elevation: 560 to 980 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 230 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Lenawee and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lenawee

Setting
Landform: Lakebeds (relict)
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey glaciolacustrine deposits

Typical profile
Ap - 0 to 9 inches: silty clay loam
Bg - 9 to 39 inches: silty clay loam
Cg - 39 to 80 inches: silty clay loam

Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)

Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 21 percent
Maximum salinity: Nonsaline (0.0 to 0.6 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Del rey

Percent of map unit: 7 percent
Landform: Lakebeds (relict)
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex, linear
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

22—Pewamo clay loam

Map Unit Setting

National map unit symbol: 68tr
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 12 inches: clay loam

H2 - 12 to 35 inches: clay loam
H3 - 35 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Metamora

Percent of map unit: 10 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Selfridge

Percent of map unit: 10 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

23A—Metamora sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 68ts
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days

Farmland classification: Prime farmland if drained

Map Unit Composition

Metamora and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Metamora

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 21 inches: sandy loam
H3 - 21 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Selfridge

Percent of map unit: 4 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Corunna

Percent of map unit: 4 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear

Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Blount

Percent of map unit: 4 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Pewamo

Percent of map unit: 3 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

24—Corunna sandy loam

Map Unit Setting

National map unit symbol: 68tt
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Corunna and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Corunna

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Selfridge

Percent of map unit: 5 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Metamora

Percent of map unit: 5 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Belleville

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY011MI - Warm Wet Sandy Depression
Hydric soil rating: Yes

29—Colwood loam

Map Unit Setting

National map unit symbol: 68tz
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Colwood and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colwood

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 45 inches: clay loam
H3 - 45 to 60 inches: stratified very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 11.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Metamora

Percent of map unit: 5 percent
Landform: Knolls on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

30—Sloan loam

Map Unit Setting

National map unit symbol: 68v0
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Sloan and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sloan

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 26 inches: silt loam
H3 - 26 to 60 inches: stratified silt loam to sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None

Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F099XY009MI - Wet Floodplain
Hydric soil rating: Yes

Minor Components

Ceresco

Percent of map unit: 10 percent
Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY008MI - Moist Floodplain
Hydric soil rating: No

37B—Ottokee variant fine sand, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 68v5
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Ottokee and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ottokee

Setting

Landform: Knolls on outwash deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: fine sand
H2 - 9 to 24 inches: fine sand
H3 - 24 to 28 inches: loamy sand
R - 28 to 32 inches: bedrock

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 24 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Oakville

Percent of map unit: 7 percent
Landform: Knolls on outwash deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

40A—Thetford loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 68v7
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Farmland of local importance

Map Unit Composition

Thetford and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Thetford

Setting

Landform: Knolls on outwash deltas
Landform position (three-dimensional): Rise

Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: loamy sand
H2 - 9 to 15 inches: sand
H3 - 15 to 38 inches: sand
H4 - 38 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Spinks

Percent of map unit: 5 percent
Landform: Knolls on outwash deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

46—Ceresco fine sandy loam

Map Unit Setting

National map unit symbol: 68vf
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Ceresco and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ceresco

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 18 inches: fine sandy loam
H2 - 18 to 34 inches: fine sandy loam
H3 - 34 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F099XY008MI - Moist Floodplain
Hydric soil rating: No

49B—Oakville fine sand, loamy substratum, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 68vj
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Oakville, loamy substratum, and similar soils: 88 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oakville, Loamy Substratum

Setting

Landform: Outwash deltas on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy eolian deposits over loamy till

Typical profile

H1 - 0 to 9 inches: fine sand
H2 - 9 to 52 inches: fine sand
H3 - 52 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Thetford

Percent of map unit: 6 percent
Landform: Outwash deltas, knolls
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Tedrow

Percent of map unit: 6 percent
Landform: Outwash deltas, knolls
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

50B—Ottokee fine sand, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 68vk
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Ottokee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ottokee

Setting

Landform: Knolls on outwash deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: fine sand
H2 - 9 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Granby

Percent of map unit: 5 percent
Landform: Depressions on outwash deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY011MI - Warm Wet Sandy Depression
Hydric soil rating: Yes

116A—Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4r
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Kibbie and similar soils: 51 percent
Colwood and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kibbie

Setting

Landform: Knolls on deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

W—Water

Map Unit Setting

National map unit symbol: nsh5
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F

Frost-free period: 140 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition
Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

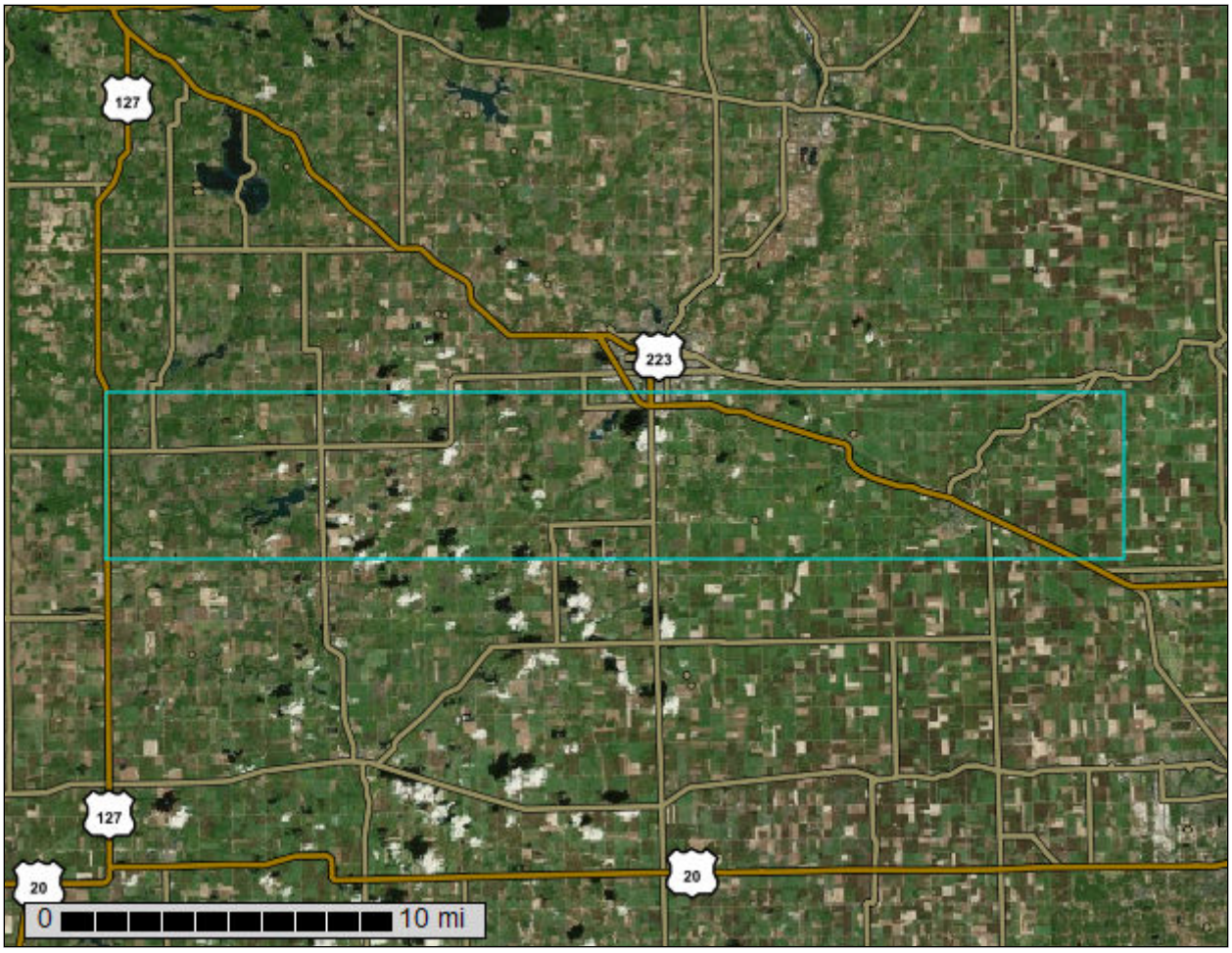
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Hillsdale County, Michigan, Lenawee County, Michigan, and Monroe County, Michigan



June 13, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

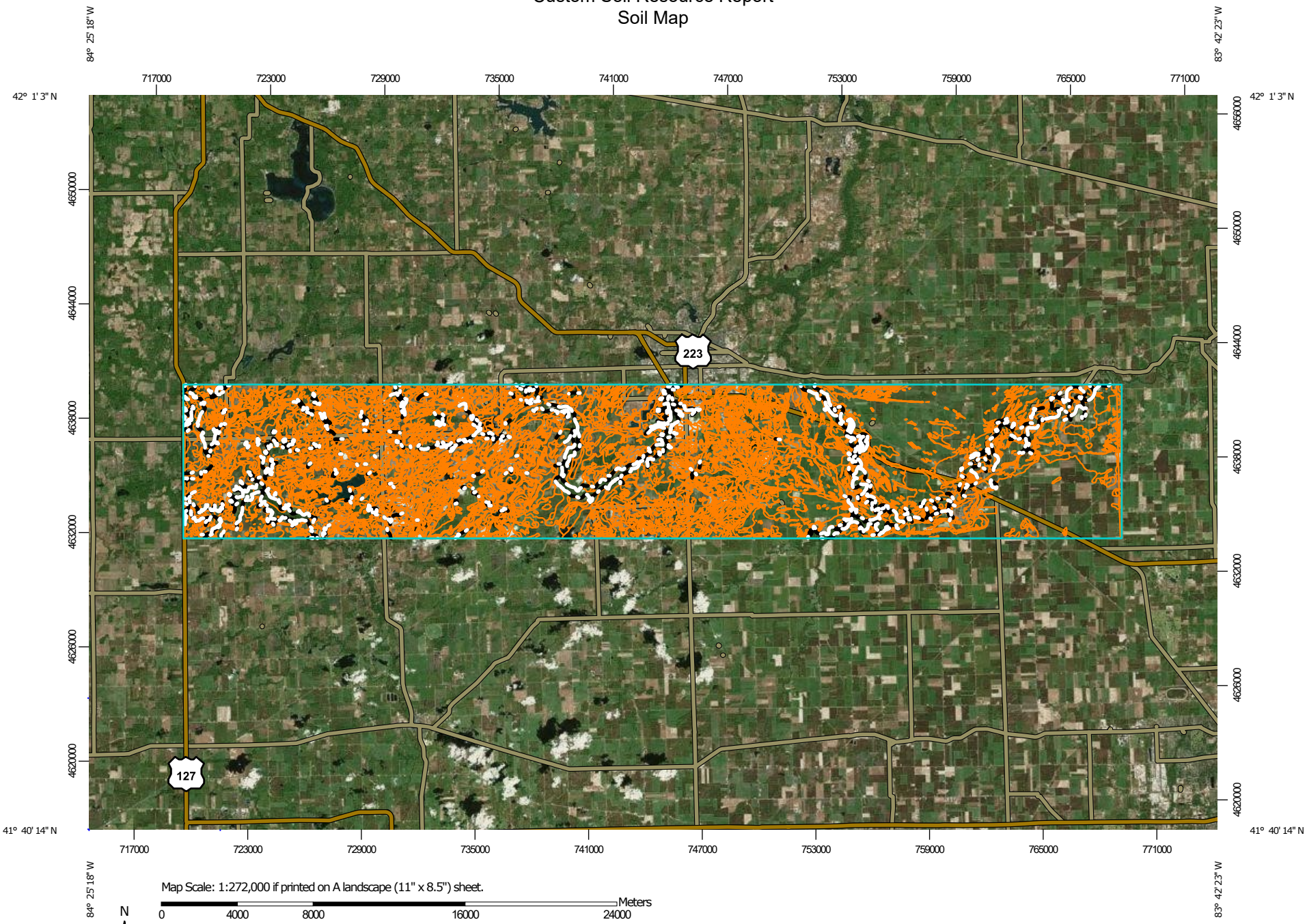
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:272,000 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 4000 8000 16000 24000

Feet
0 10000 20000 40000 60000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:15,800 to 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hillsdale County, Michigan
Survey Area Data: Version 22, Aug 27, 2024

Soil Survey Area: Lenawee County, Michigan
Survey Area Data: Version 20, Aug 27, 2024

Soil Survey Area: Monroe County, Michigan
Survey Area Data: Version 22, Aug 27, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

MAP LEGEND

MAP INFORMATION

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
12B	Williamstown-Conover complex, 1 to 6 percent slopes	12.0	0.0%
12C2	Wawasee loam, 6 to 12 percent slopes, eroded	1.6	0.0%
12E	Wawasee loam, 18 to 35 percent slopes	0.3	0.0%
13B	Conover loam, 1 to 4 percent slopes	1.8	0.0%
14	Wolcott silt loam	0.1	0.0%
15B	Boyer loamy sand, 1 to 6 percent slopes	0.7	0.0%
16B	Fox sandy loam, till plain, 2 to 6 percent slopes	5.5	0.0%
16C2	Fox sandy loam, Huron Lobe, 6 to 12 percent slopes, eroded	1.7	0.0%
16D2	Fox gravelly sandy loam, 12 to 18 percent slopes, eroded	0.6	0.0%
16E	Fox gravelly sandy loam, 18 to 35 percent slopes	1.2	0.0%
18B	Glynwood-Blount complex, 1 to 6 percent slopes	13.5	0.0%
18C2	Morley loam, 6 to 12 percent slopes, eroded	8.9	0.0%
18D2	Morley clay loam, 12 to 18 percent slopes, eroded	0.1	0.0%
18E	Morley loam, 18 to 35 percent slopes	2.4	0.0%
19B	Blount loam, 0 to 4 percent slopes	1.6	0.0%
20	Pewamo silt loam	1.5	0.0%
29B	Steamburg sandy loam, 2 to 6 percent slopes	10.2	0.0%
32	Sloan silt loam, 0 to 1 percent slopes, frequently flooded	12.3	0.0%
37A	Matherton loam, 0 to 3 percent slopes	4.7	0.0%
43	Histosols and Aquents, ponded	0.1	0.0%
55	Pits, gravel	0.1	0.0%
59	Cut and fill land	2.4	0.0%
Subtotals for Soil Survey Area		**83.3**	**0.1%**
Totals for Area of Interest		**98,975.9**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AaA	Adrian muck, 0 to 3 percent slopes	316.9	0.3%
BaA	Barry sandy loam, overwashed, 0 to 3 percent slopes	196.7	0.2%
BbA	Berrien loamy sand, 0 to 3 percent slopes	33.4	0.0%
BbB	Berrien loamy sand, 3 to 7 percent slopes	141.2	0.1%
BbB2	Berrien loamy sand, 3 to 7 percent slopes, moderately eroded	15.7	0.0%
BcA	Berrien sandy loam, 0 to 3 percent slopes	789.4	0.8%
BcB	Berrien sandy loam, 3 to 7 percent slopes	1,137.8	1.1%
BcB2	Berrien sandy loam, 3 to 7 percent slopes, moderately eroded	16.8	0.0%
BcC	Berrien sandy loam, 7 to 15 percent slopes	3.4	0.0%
BdA	Berville loam, 0 to 3 percent slopes	65.1	0.1%
BeA	Berville sandy loam, 0 to 3 percent slopes	64.0	0.1%
BgA	Blount loam and Pewamo clay loam, 0 to 3 percent slopes	36.1	0.0%
BhA	Brady sandy loam, 0 to 3 percent slopes	1,567.9	1.6%
BkA	Brady and Macomb loams, 0 to 3 percent slopes	11,441.0	11.6%
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	383.4	0.4%
BnA	Bronson sandy loam, 0 to 3 percent slopes	835.6	0.8%
BnB	Bronson sandy loam, 3 to 7 percent slopes	318.8	0.3%
BntaaA	Blount loam, 0 to 2 percent slopes	2,226.9	2.2%
BntaaB	Blount loam, 2 to 6 percent slopes	4,826.9	4.9%
BntabB	Blount loam, 2 to 6 percent slopes, eroded	319.5	0.3%
BoA	Brookston loam, 0 to 3 percent slopes	351.6	0.4%
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	1,169.8	1.2%
CaB	Cadmus loam, 3 to 7 percent slopes	723.7	0.7%
CaB2	Cadmus loam, 3 to 7 percent slopes, moderately eroded	67.8	0.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CarabA	Carlisle muck, 0 to 2 percent slopes	9.8	0.0%
CaracA	Carlisle muck, disintegration moraine, 0 to 2 percent slopes	1,751.3	1.8%
CbA	Cadmus sandy loam, 0 to 3 percent slopes	180.2	0.2%
CbB	Cadmus sandy loam, 3 to 7 percent slopes	593.8	0.6%
CbB2	Cadmus sandy loam, 3 to 7 percent slopes, moderately eroded	20.0	0.0%
CcA	Cadmus and Blount loams, 0 to 3 percent slopes	540.6	0.5%
CeA	Colwood very fine sandy loam, 0 to 3 percent slopes	3,208.0	3.2%
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	1,744.5	1.8%
CgA	Conover loam, 0 to 3 percent slopes	414.0	0.4%
CgB	Conover loam, 3 to 7 percent slopes	80.9	0.1%
Co	Colwood loam	719.3	0.7%
EaA	Edwards muck, 0 to 3 percent slopes	192.2	0.2%
FbA	Fox loam, 0 to 3 percent slopes	48.9	0.0%
FbB	Fox loam, 3 to 7 percent slopes	322.8	0.3%
FbC	Fox loam, 7 to 15 percent slopes	47.7	0.0%
FbC2	Fox loam, 7 to 15 percent slopes, moderately eroded	3.9	0.0%
FcA	Fox sandy loam, till plain, 0 to 2 percent slopes	397.0	0.4%
FcB	Fox sandy loam, till plain, 2 to 6 percent slopes	1,098.6	1.1%
FcB2	Fox sandy loam, 3 to 7 percent slopes, moderately eroded	150.8	0.2%
FcC	Fox sandy loam, Huron Lobe, 6 to 12 percent slopes	56.5	0.1%
FcC2	Fox sandy loam, Huron Lobe, 6 to 12 percent slopes, eroded	129.7	0.1%
FcD	Fox sandy loam, Huron Lobe, 12 to 25 percent slopes	3.6	0.0%
FdC3	Fox soils, 7 to 15 percent slopes, severely eroded	18.1	0.0%
GaA	Genesee loam, 0 to 2 percent slopes, occasionally flooded	625.9	0.6%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
GbA	Genesee sandy loam, 0 to 3 percent slopes	231.8	0.2%
GbB	Genesee sandy loam, 3 to 7 percent slopes	5.3	0.0%
GcA	Genesee and Eel loams, 0 to 3 percent slopes	541.0	0.5%
GdA	Granby loamy sand, 0 to 3 percent slopes	229.7	0.2%
GeA	Granby sandy loam, 0 to 3 percent slopes	233.1	0.2%
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	3,000.5	3.0%
GgA	Griffin and Sloan loams, 0 to 3 percent slopes	530.0	0.5%
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	2,416.8	2.4%
Gp	Gravel pits	188.4	0.2%
Gs	Gilford sandy loam	5.5	0.0%
HcA	Hoytville clay loam and silty clay loam, 0 to 3 percent slopes	859.9	0.9%
HdA	Hoytville mucky clay loam, 0 to 3 percent slopes	24.9	0.0%
HeA	Hoytville clay loam and Rimer sandy loam, 0 to 3 percent slopes	433.6	0.4%
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	1,343.1	1.4%
HgtahA	Houghton muck, 0 to 1 percent slopes	23.6	0.0%
HgtanA	Houghton muck, disintegration moraine, 0 to 2 percent slopes	597.1	0.6%
IaA	Ionia loam, 0 to 3 percent slopes	1,205.4	1.2%
IaB	Ionia loam, 3 to 7 percent slopes	111.9	0.1%
KaC	Kendallville loam, 7 to 15 percent slopes	27.5	0.0%
KaC2	Kendallville loam, 7 to 15 percent slopes, moderately eroded	29.3	0.0%
KbC	Kendallville sandy loam, 7 to 15 percent slopes	66.9	0.1%
KcC2	Kendallville soils, 7 to 15 percent slopes, moderately or severely eroded	33.3	0.0%
KdA	Kerston muck and loams, 0 to 3 percent slopes	121.6	0.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
KeA	Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes	648.4	0.7%
KeB	Kibbie and Colwood fine sandy loams, 3 to 7 percent slopes	152.5	0.2%
KfA	Kokomo and Barry loams, 0 to 3 percent slopes	1,147.1	1.2%
KgA	Kokomo, Barry, and Wallkill loams, overwashed, 0 to 3 percent slopes	377.7	0.4%
LcA	Linwood muck, 0 to 3 percent slopes	86.5	0.1%
Le	Lenawee silty clay loam, 0 to 1 percent slopes	136.9	0.1%
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	817.1	0.8%
MbA	Macomb sandy clay loam and Hoytville clay loam, 0 to 3 percent slopes	702.3	0.7%
McA	Maumee loamy sand, 0 to 3 percent slopes	127.5	0.1%
MfD3	Miami soils, 15 to 25 percent slopes, severely eroded	5.1	0.0%
MhA	Morley loam, 0 to 3 percent slopes	24.7	0.0%
MhB	Glynwood loam, 2 to 6 percent slopes	1,222.5	1.2%
MhB2	Glynwood loam, 2 to 6 percent slopes, eroded	9,301.5	9.4%
MhC	Morley loam, 6 to 12 percent slopes	400.0	0.4%
MhC2	Morley loam, 6 to 12 percent slopes, eroded	4,033.4	4.1%
MhD	Morley loam, 12 to 25 percent slopes	63.8	0.1%
MhD2	Morley loam, 12 to 25 percent slopes, moderately eroded	391.4	0.4%
MhE	Morley loam, 25+ percent slopes	12.7	0.0%
MkB3	Glynwood clay loam, 2 to 6 percent slopes, severely eroded	15.9	0.0%
MkC3	Morley soils, 7 to 15 percent slopes, severely eroded	1,490.3	1.5%
MkD3	Morley clay loam, 12 to 18 percent slopes, severely eroded	619.9	0.6%
MkE2	Morley soils, 25+ percent slopes, moderately or severely eroded	10.6	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MmA	Metamora sandy loam, 0 to 3 percent slopes	28.3	0.0%
NaA	Nappanee silt loam, 0 to 3 percent slopes	2,416.6	2.4%
NaB	Nappanee silt loam, 3 to 7 percent slopes	15.2	0.0%
NaB2	Nappanee silt loam, 3 to 7 percent slopes, moderately eroded	1.7	0.0%
NbB	Nappanee loam, 3 to 7 percent slopes	1,605.4	1.6%
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	1,227.4	1.2%
OaA	Ogden muck, 0 to 3 percent slopes	12.9	0.0%
ObA	Oshtemo loamy sand, 0 to 3 percent slopes	18.0	0.0%
ObB	Oshtemo loamy sand, 3 to 7 percent slopes	17.4	0.0%
OcC	Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded	49.5	0.1%
OkB	Oakville fine sand, loamy substratum, 0 to 6 percent slopes	26.0	0.0%
OtB	Ottokee fine sand, 0 to 6 percent slopes	10.0	0.0%
PaA	Palms muck, 0 to 3 percent slopes	68.4	0.1%
PbA	Pewamo clay loam, 0 to 2 percent slopes	1,611.3	1.6%
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	631.2	0.6%
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	591.8	0.6%
PdB	Plainfield and Berrien loamy sands, 3 to 7 percent slopes	208.6	0.2%
PeA	Plainfield and Ottawa loamy sands, 0 to 3 percent slopes	34.4	0.0%
PeB	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes	903.7	0.9%
PeB2	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes, moderately eroded	25.6	0.0%
PeC	Plainfield and Ottawa loamy sands, 7 to 15 percent slopes	425.6	0.4%
PeC2	Plainfield and Ottawa loamy sands, 7 to 15 percent slopes, moderately eroded	26.6	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PwmaaA	Pewamo clay loam, dense substratum, 0 to 1 percent slopes	411.4	0.4%
RaA	Rifle peat, 0 to 3 percent slopes	1.2	0.0%
RbA	Rollin muck, 0 to 3 percent slopes	75.3	0.1%
SbA	Sebewa sandy loam, 0 to 3 percent slopes	112.6	0.1%
SdC	St. Clair loam, 7 to 15 percent slopes	12.1	0.0%
SdC2	St. Clair loam, 7 to 15 percent slopes, moderately eroded	302.5	0.3%
SdD2	St. Clair loam, 12 to 25 percent slopes, moderately eroded	193.2	0.2%
SeC3	St. Clair soils, 7 to 15 percent slopes, severely eroded	35.3	0.0%
Sf	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	500.2	0.5%
Sg	Sewage lagoons	14.5	0.0%
TaA	Tawas muck, 0 to 3 percent slopes	35.9	0.0%
ThA	Thetford loamy sand, 0 to 3 percent slopes	5.0	0.0%
Ud	Udorthents, nearly level and undulating	76.3	0.1%
W	Water	1,223.0	1.2%
WaA	Wallkill loam, overwashed, 0 to 3 percent slopes	76.9	0.1%
WawabB	Wawasee loam, 2 to 6 percent slopes	85.4	0.1%
WawabC	Wawasee loam, 6 to 12 percent slopes	15.5	0.0%
WawacB	Wawasee loam, 2 to 6 percent slopes, eroded	1.4	0.0%
WawacC	Wawasee loam, 6 to 12 percent slopes, eroded	37.1	0.0%
WawadD	Wawasee loam, 12 to 25 percent slopes, eroded	10.5	0.0%
WcA	Wauseon loam, 0 to 3 percent slopes	4,242.5	4.3%
WdA	Willette muck, 0 to 3 percent slopes	62.6	0.1%
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	7,259.2	7.3%
Subtotals for Soil Survey Area		**98,200.5**	**99.2%**
Totals for Area of Interest		**98,975.9**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
16A	Tedrow loamy sand, 0 to 3 percent slopes	13.9	0.0%
18	Granby loamy fine sand	3.9	0.0%
19A	Selfridge loamy sand, 0 to 3 percent slopes	11.5	0.0%
23A	Metamora sandy loam, 0 to 3 percent slopes	20.5	0.0%
24	Corunna sandy loam	1.3	0.0%
40A	Thetford loamy sand, 0 to 3 percent slopes	30.0	0.0%
49B	Oakville fine sand, loamy substratum, 0 to 6 percent slopes	21.4	0.0%
50B	Ottokee fine sand, 0 to 6 percent slopes	14.7	0.0%
55	Gilford sandy loam	17.0	0.0%
112A	Wauseon loam, 0 to 3 percent slopes	89.3	0.1%
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	126.6	0.1%
Subtotals for Soil Survey Area		**350.1**	**0.4%**
Totals for Area of Interest		**98,975.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the

scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Hillsdale County, Michigan

12B—Williamstown-Conover complex, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 6b8c
Elevation: 580 to 1,200 feet
Mean annual precipitation: 30 to 45 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Williamstown and similar soils: 62 percent
Conover and similar soils: 32 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Williamstown

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 33 inches: clay loam
H3 - 33 to 60 inches: loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 18 to 39 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Description of Conover

Setting

Landform: Knolls on ground moraines

Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 27 inches: clay loam
H3 - 27 to 60 inches: loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Steamburg

Percent of map unit: 3 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Wolcott

Percent of map unit: 3 percent
Landform: Ground moraines, depressions
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

12C2—Wawasee loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvgm
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 7 inches: loam
Bt1 - 7 to 23 inches: loam
Bt2 - 23 to 31 inches: clay loam
C - 31 to 79 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B

Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier
Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston
Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

12E—Wawasee loam, 18 to 35 percent slopes

Map Unit Setting
National map unit symbol: 2wvgv
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition
Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

A - 0 to 8 inches: loam
Bt1 - 8 to 24 inches: loam
Bt2 - 24 to 32 inches: clay loam
C - 32 to 79 inches: loam

Properties and qualities

Slope: 18 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Fox

Percent of map unit: 6 percent
Landform: Outwash plains, outwash terraces
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, riser
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

13B—Conover loam, 1 to 4 percent slopes

Map Unit Setting

National map unit symbol: 6b8h
Elevation: 580 to 1,000 feet
Mean annual precipitation: 30 to 45 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 27 inches: clay loam
H3 - 27 to 60 inches: loam

Properties and qualities

Slope: 1 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Williamstown

Percent of map unit: 4 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Wolcott

Percent of map unit: 4 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Sloan

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

14—Wolcott silt loam

Map Unit Setting

National map unit symbol: 6b8j
Elevation: 580 to 1,000 feet
Mean annual precipitation: 28 to 45 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Wolcott and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wolcott

Setting

Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear

Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 20 inches: silt loam
H2 - 20 to 38 inches: clay loam
H3 - 38 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 11.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Minor Components

Conover

Percent of map unit: 1 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sloan

Percent of map unit: 1 percent
Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

Houghton

Percent of map unit: 1 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

15B—Boyer loamy sand, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2t6l4
Elevation: 700 to 1,250 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Boyer and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boyer

Setting

Landform: Moraines, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Head slope, tread
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy outwash and/or sandy outwash over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: loamy sand
E - 9 to 17 inches: loamy sand
Bt - 17 to 30 inches: sandy loam
2C - 30 to 79 inches: stratified coarse sand to gravelly sand to very gravelly sand

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: A
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

Minor Components

Oshtemo
Percent of map unit: 9 percent
Landform: Stream terraces, moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, tread
Down-slope shape: Linear
Across-slope shape: Convex, linear
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Bronson
Percent of map unit: 6 percent
Landform: Moraines, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

16B—Fox sandy loam, till plain, 2 to 6 percent slopes

Map Unit Setting
National map unit symbol: 2wvh5
Elevation: 650 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting
Landform: Outwash plains, outwash terraces
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest, tread
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loamy glaciofluvial deposits over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified sand to gravel

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

16C2—Fox sandy loam, Huron Lobe, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvh7
Elevation: 660 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox, eroded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Eroded

Setting

Landform: Ice-contact slopes, outwash plains, moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Loamy till over sandy and gravelly outwash

Typical profile

Ap - 0 to 8 inches: sandy loam
Bt1 - 8 to 26 inches: sandy clay loam
Bt2 - 26 to 31 inches: gravelly loam
2C - 31 to 79 inches: stratified gravelly sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B

Ecological site: R111XC010IN - Well Drained Overflow, F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Matherton
Percent of map unit: 6 percent
Landform: Drainageways, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB403IN - Outwash Upland
Hydric soil rating: No

Sebewa
Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

16D2—Fox gravelly sandy loam, 12 to 18 percent slopes, eroded

Map Unit Setting
National map unit symbol: 6b8r
Elevation: 580 to 1,300 feet
Mean annual precipitation: 30 to 42 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Fox and similar soils: 87 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting
Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear

Across-slope shape: Concave, convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: gravelly sandy loam
H2 - 8 to 34 inches: gravelly sandy clay loam
H3 - 34 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Hillsdale

Percent of map unit: 6 percent
Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Riddles

Percent of map unit: 6 percent
Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Sebewa

Percent of map unit: 1 percent
Landform: Drainageways on ice-contact slopes

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

16E—Fox gravelly sandy loam, 18 to 35 percent slopes

Map Unit Setting

National map unit symbol: 6b8s
Elevation: 580 to 1,300 feet
Mean annual precipitation: 30 to 42 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Fox and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: gravelly sandy loam
H2 - 8 to 34 inches: gravelly sandy clay loam
H3 - 34 to 60 inches: gravelly sand

Properties and qualities

Slope: 18 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent

Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Hillsdale

Percent of map unit: 3 percent
Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Riddles

Percent of map unit: 3 percent
Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Sebewa

Percent of map unit: 1 percent
Landform: Drainageways on ice-contact slopes
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

18B—Glynwood-Blount complex, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 6b8v
Elevation: 580 to 1,530 feet
Mean annual precipitation: 29 to 42 inches

Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Glynwood and similar soils: 57 percent
Blount and similar soils: 37 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 26 inches: clay loam
H3 - 26 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Description of Blount

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 32 inches: silty clay loam
H3 - 32 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 3 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Steamburg

Percent of map unit: 3 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

18C2—Morley loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wp26
Elevation: 750 to 1,220 feet
Mean annual precipitation: 32 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 165 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 17 inches: clay
Bt2 - 17 to 28 inches: clay
BC - 28 to 33 inches: clay loam
Cd - 33 to 79 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 24 to 38 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood

Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

18D2—Morley clay loam, 12 to 18 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvhm
Elevation: 770 to 1,250 feet
Mean annual precipitation: 35 to 39 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 8 inches: clay loam
Bt1 - 8 to 17 inches: silty clay
Bt2 - 17 to 28 inches: clay
BC - 28 to 33 inches: clay loam

Cd - 33 to 79 inches: clay loam

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: 26 to 45 inches to densic material
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood

Percent of map unit: 8 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 2 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

18E—Morley loam, 18 to 35 percent slopes

Map Unit Setting

National map unit symbol: 6b8y
Elevation: 580 to 1,400 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Typical profile

H1 - 0 to 6 inches: loam
H2 - 6 to 31 inches: clay loam
H3 - 31 to 60 inches: clay loam

Properties and qualities

Slope: 18 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Coloma

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Hydric soil rating: No

Pewamo

Percent of map unit: 1 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Sloan

Percent of map unit: 1 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

19B—Blount loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 2ydcv
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, concave
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 30 inches: silty clay
BC - 30 to 37 inches: clay loam
Cd - 37 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: 26 to 48 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Glynwood

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 6 percent
Landform: Depressions, ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave

Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Conover

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Badaxe

Percent of map unit: 2 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

20—Pewamo silt loam

Map Unit Setting

National map unit symbol: 6b90
Elevation: 580 to 1,530 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 11 inches: silt loam
H2 - 11 to 48 inches: clay loam
H3 - 48 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Minor Components

Houghton

Percent of map unit: 1 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Blount

Percent of map unit: 1 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Glynwood

Percent of map unit: 1 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

29B—Steamburg sandy loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 6b95
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Steamburg and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Steamburg

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 9 inches: sandy loam
H2 - 9 to 34 inches: sandy loam
H3 - 34 to 40 inches: clay loam
H4 - 40 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Fox

Percent of map unit: 3 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Williamstown

Percent of map unit: 2 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Spinks

Percent of map unit: 2 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

32—Sloan silt loam, 0 to 1 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2ydd3
Elevation: 520 to 1,340 feet
Mean annual precipitation: 31 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 200 days
Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Sloan, frequently flooded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sloan, Frequently Flooded

Setting

Landform: Depressions on flood plains
Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy alluvium

Typical profile

Ap - 0 to 12 inches: silt loam
Bg - 12 to 42 inches: silty clay loam
Cg - 42 to 79 inches: stratified gravelly sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: Occasional
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

Minor Components

Shoals

Percent of map unit: 6 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA003MI - Moist Floodplains
Hydric soil rating: No

Sloan, frequently flooded, long duration

Percent of map unit: 4 percent
Landform: Depressions on flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

37A—Matherton loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b9d
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Matherton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Matherton

Setting

Landform: Knolls on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 25 inches: loam
H3 - 25 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Fox

Percent of map unit: 3 percent
Landform: Knolls on outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Sebewa

Percent of map unit: 3 percent
Landform: Depressions on outwash plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Glynwood

Percent of map unit: 2 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Williamstown

Percent of map unit: 2 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

43—Histosols and Aquents, ponded

Map Unit Setting

National map unit symbol: 6b9n
Elevation: 580 to 1,530 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Histosols and similar soils: 60 percent

Aquents and similar soils: 35 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Histosols

Setting

Landform: Marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material

Typical profile

Oa - 0 to 16 inches: muck
H2 - 16 to 60 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: A/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Description of Aquents

Setting

Landform: Marshes
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium

Typical profile

H1 - 0 to 60 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent

Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: A/D
Ecological site: F098XA020MI - Wet Sandy Drift Depressions
Hydric soil rating: Yes

Minor Components

Thetford

Percent of map unit: 2 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA019MI - Moist Sandy Drift Plains
Hydric soil rating: No

Blount

Percent of map unit: 2 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Matherton

Percent of map unit: 1 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

55—Pits, gravel

Map Unit Composition

Gravel pits: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gravel Pits

Setting

Landform: Outwash plains, kames
Landform position (three-dimensional): Rise
Down-slope shape: Linear

Across-slope shape: Convex

59—Cut and fill land

Map Unit Composition

Cut and fill land: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Lenawee County, Michigan

AaA—Adrian muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b27
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Adrian and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Adrian

Setting

Landform: Depressions on strand plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over sandy glaciofluvial deposits

Typical profile

Oa - 0 to 32 inches: muck
H2 - 32 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Very high (about 14.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

BaA—Barry sandy loam, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b28
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Barry and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Barry

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: sandy loam
H2 - 12 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BbA—Berrien loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b29
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BbB—Berrien loamy sand, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2b
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BbB2—Berrien loamy sand, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b2c
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien, Moderately Eroded

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BcA—Berrien sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2d
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

BcB—Berrien sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2f
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

BcB2—Berrien sandy loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b2g
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien, Moderately Eroded

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BcC—Berrien sandy loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b2h
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BdA—Berville loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2j
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Berville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berville

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 24 inches: sandy loam
H3 - 24 to 36 inches: loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BeA—Berville sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2k
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Berville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berville

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 10 inches: sandy loam
H2 - 10 to 24 inches: sandy loam
H3 - 24 to 36 inches: loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BgA—Blount loam and Pewamo clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2q
Elevation: 580 to 1,530 feet
Mean annual precipitation: 29 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 60 percent
Pewamo and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 10 inches: silty clay loam
H3 - 10 to 26 inches: silty clay loam
H4 - 26 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Description of Pewamo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 16 inches: clay loam
H2 - 16 to 32 inches: silty clay loam
H3 - 32 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BhA—Brady sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2r
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Knolls on strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 5 percent
Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BkA—Brady and Macomb loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2s
Elevation: 600 to 1,200 feet

Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 46 percent
Macomb and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Macomb

Setting

Landform: Knolls on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 32 inches: loam

H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 10 percent
Landform: Strand plains, depressions
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BmA—Brady and Macomb sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2t
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 46 percent
Macomb and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Macomb

Setting

Landform: Knolls on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 32 inches: loam
H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BnA—Bronson sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2v
Elevation: 500 to 1,200 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Bronson and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bronson

Setting

Landform: Knolls on strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 38 inches: sandy loam
H3 - 38 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Brookston

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BnB—Bronson sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2w
Elevation: 500 to 1,200 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Bronson and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bronson

Setting

Landform: Knolls on strand plains

Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 38 inches: sandy loam
H3 - 38 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Brookston

Percent of map unit: 5 percent
Landform: Depressions on moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BntaaA—Blount loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wp2k
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, concave
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 30 inches: silty clay
BC - 30 to 37 inches: clay loam
Cd - 37 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 28 to 48 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 6 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Conover

Percent of map unit: 4 percent

Landform: End moraines, ground moraines
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Glynwood

Percent of map unit: 3 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Badaxe

Percent of map unit: 2 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

BntaaB—Blount loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2wp2l
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: End moraines, ground moraines
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 28 inches: silty clay
BC - 28 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 26 to 45 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Glynwood, eroded

Percent of map unit: 8 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Conover

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Depressions on end moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear

Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Badaxe

Percent of map unit: 2 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, convex
Across-slope shape: Linear
Hydric soil rating: No

BntabB—Blount loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wp2m
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount, eroded, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount, Eroded

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 7 inches: loam
Bt - 7 to 24 inches: silty clay
BC - 24 to 30 inches: clay loam
Cd - 30 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 24 to 40 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)

Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Glynwood, eroded

Percent of map unit: 8 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Conover

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Depressions, end moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Badaxe

Percent of map unit: 2 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, convex
Across-slope shape: Linear
Hydric soil rating: No

BoA—Brookston loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2x
Elevation: 500 to 1,020 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Brookston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brookston

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 23 inches: clay loam
H3 - 23 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BpA—Brookston loam, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2y
Elevation: 600 to 900 feet
Mean annual precipitation: 35 to 40 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 150 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Brookston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brookston

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 18 inches: clay loam
H3 - 18 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 11.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

CaB—Cadmus loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2z
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CaB2—Cadmus loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b30
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CarabA—Carlisle muck, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2zdk5
Elevation: 740 to 990 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Carlisle and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carlisle

Setting

Landform: Depressions on moraines, depressions on glacial drainage channels, depressions on outwash plains, depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Woody organic material

Typical profile

Oa1 - 0 to 13 inches: muck
Oa2 - 13 to 37 inches: muck
Oa3 - 37 to 80 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 0.6
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Linwood

Percent of map unit: 4 percent
Landform: Depressions on moraines, depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Wallkill

Percent of map unit: 4 percent
Landform: Depressions on glacial drainage channels, depressions on moraines, depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Adrian

Percent of map unit: 2 percent
Landform: Depressions on moraines, drainageways on moraines, drainageways on glacial drainage channels, drainageways on outwash plains, depressions on outwash plains, depressions on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

CaracA—Carlisle muck, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2zdl1
Elevation: 700 to 850 feet
Mean annual precipitation: 35 to 41 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Carlisle and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carlisle

Setting

Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material and/or woody organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 79 inches: woody muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very high (about 24.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Minor Components

Linwood

Percent of map unit: 9 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

Pewamo

Percent of map unit: 6 percent
Landform: Depressions on moraines, drainageways on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression

Hydric soil rating: Yes

CbA—Cadmus sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b31
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

CbB—Cadmus sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b32
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CbB2—Cadmus sandy loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b33
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CcA—Cadmus and Blount loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b34
Elevation: 580 to 1,530 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Cadmus and similar soils: 46 percent
Blount and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Description of Blount

Setting

Landform: Knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 10 inches: silty clay loam
H3 - 10 to 26 inches: silty clay loam
H4 - 26 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 10 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

CeA—Colwood very fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b36
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Colwood and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: very fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

CfA—Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b37
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Colwood and similar soils: 51 percent
Wauseon and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Wauseon

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

CgA—Conover loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b38
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Colwood

Percent of map unit: 5 percent
Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

CgB—Conover loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b39
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches

Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Colwood

Percent of map unit: 5 percent
Landform: Knolls on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

Co—Colwood loam

Map Unit Setting

National map unit symbol: 68tz
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Colwood and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colwood

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 45 inches: clay loam
H3 - 45 to 60 inches: stratified very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 11.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Metamora

Percent of map unit: 5 percent
Landform: Knolls on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

EaA—Edwards muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b3c
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Edwards and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Edwards

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over marl

Typical profile

Oa - 0 to 24 inches: muck
Lma - 24 to 60 inches: marly material

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 90 percent
Available water supply, 0 to 60 inches: Very high (about 14.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: R111XB002IN - Limnic Muck
Hydric soil rating: Yes

FbA—Fox loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b3h
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FbB—Fox loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b3j
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FbC—Fox loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b3k
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FbC2—Fox loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b3l
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FcA—Fox sandy loam, till plain, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wvh4
Elevation: 650 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Outwash plains, outwash terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest, tread
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loamy glaciofluvial deposits over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified sand to gravel

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B

Ecological site: R111XC010IN - Well Drained Overflow, F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Matherton
Percent of map unit: 6 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB403IN - Outwash Upland
Hydric soil rating: No

Sebewa
Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

FcB—Fox sandy loam, till plain, 2 to 6 percent slopes

Map Unit Setting
National map unit symbol: 2wvh5
Elevation: 650 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting
Landform: Outwash plains, outwash terraces
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest, tread
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loamy glaciofluvial deposits over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified sand to gravel

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

FcB2—Fox sandy loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b3p
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: sandy loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FcC—Fox sandy loam, Huron Lobe, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2wvh6
Elevation: 660 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Moraines, outwash plains, ice-contact slopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Loamy till over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified gravelly sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains

Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

FcC2—Fox sandy loam, Huron Lobe, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvh7
Elevation: 660 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox, eroded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Eroded

Setting

Landform: Ice-contact slopes, outwash plains, moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Loamy till over sandy and gravelly outwash

Typical profile

Ap - 0 to 8 inches: sandy loam

Bt1 - 8 to 26 inches: sandy clay loam
Bt2 - 26 to 31 inches: gravelly loam
2C - 31 to 79 inches: stratified gravelly sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R111XC010IN - Well Drained Overflow, F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB403IN - Outwash Upland
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

FcD—Fox sandy loam, Huron Lobe, 12 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2wvh8
Elevation: 650 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Outwash plains, moraines, ice-contact slopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loamy till over sandy and gravelly outwash

Typical profile

A - 0 to 9 inches: sandy loam
Bt1 - 9 to 22 inches: sandy clay loam
Bt2 - 22 to 30 inches: gravelly loam
2C - 30 to 79 inches: stratified gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B

Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Matherton
Percent of map unit: 6 percent
Landform: Drainageways, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sebewa
Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

FdC3—Fox soils, 7 to 15 percent slopes, severely eroded

Map Unit Setting
National map unit symbol: 6b3w
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Farmland of local importance

Map Unit Composition
Fox, severely eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Severely Eroded

Setting
Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: clay loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

GaA—Genesee loam, 0 to 2 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: 2z6cv
Elevation: 340 to 1,280 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee, occasionally flooded, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee, Occasionally Flooded

Setting

Landform: Flood-plain steps, natural levees
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

Ap - 0 to 8 inches: loam
Bw - 8 to 32 inches: loam
C - 32 to 79 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 30 to 33 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

Minor Components

Eel, frequently flooded

Percent of map unit: 8 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Sloan, occassionally ponded

Percent of map unit: 7 percent
Landform: Depressions, flood-plain steps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Shoals, occasionally flooded

Percent of map unit: 5 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

GbA—Genesee sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b41
Elevation: 580 to 900 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F099XY008MI - Moist Floodplain
Hydric soil rating: No

GbB—Genesee sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b42
Elevation: 580 to 900 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

GcA—Genesee and Eel loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b43
Elevation: 340 to 900 feet
Mean annual precipitation: 30 to 46 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 120 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee and similar soils: 51 percent
Eel and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

Description of Eel

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: loam
H3 - 20 to 60 inches: stratified sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

GdA—Granby loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b44
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Granby and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Granby

Setting

Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciofluvial deposits and/or sandy glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: loamy sand
H2 - 8 to 36 inches: fine sand
H3 - 36 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

GeA—Granby sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b45
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Granby and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Granby

Setting

Landform: Depressions on strand plains
Landform position (three-dimensional): Talf

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciofluvial deposits and/or sandy glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: fine sand
H3 - 36 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

GfA—Griffin and Genesee loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b46
Elevation: 580 to 1,000 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Genesee and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F111XB204IN - Dry Alluvium Forest

Hydric soil rating: No

GgA—Griffin and Sloan loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b47
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Sloan and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Sloan

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 22 inches: clay loam
H3 - 22 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

GhA—Griffin and Sloan sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b48
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Sloan and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Sloan

Setting

Landform: Depressions on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 22 inches: clay loam
H3 - 22 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Occasional

Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

Gp—Gravel pits

Map Unit Composition

Gravel pits: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Gs—Gilford sandy loam

Map Unit Setting

National map unit symbol: 68vn
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Gilford and similar soils: 88 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gilford

Setting

Landform: Depressions on outwash deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy over sandy glaciofluvial deposits

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 28 inches: sandy loam
H3 - 28 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Granby

Percent of map unit: 12 percent
Landform: Depressions on outwash deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY011MI - Warm Wet Sandy Depression
Hydric soil rating: Yes

HcA—Hoytville clay loam and silty clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4d
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silty clay loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

HdA—Hoytville mucky clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4f
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Hoytville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Depressions, depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

HeA—Hoytville clay loam and Rimer sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4g
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 51 percent
Rimer and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Rimer

Setting

Landform: Outwash deltas on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy over clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 7 inches: loamy sand
H2 - 7 to 15 inches: fine sand
H3 - 15 to 30 inches: sandy loam
H4 - 30 to 60 inches: clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

HfA—Hoytville and Wauseon loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4h
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 51 percent
Wauseon and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Wauseon

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

HgtahA—Houghton muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2zdlc
Elevation: 720 to 1,100 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Houghton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton

Setting

Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 80 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 3 percent
Maximum salinity: Nonsaline to very slightly saline (0.4 to 2.7 mmhos/cm)
Sodium adsorption ratio, maximum: 0.8
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R098XA002MI - Inland Salt Marshes, F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Minor Components

Adrian

Percent of map unit: 4 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Edwards

Percent of map unit: 3 percent
Landform: Depressions on outwash plains, depressions on moraines on outwash plains

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Palms

Percent of map unit: 2 percent
Landform: Depressions on moraines, swamps on moraines, drainageways on till plains, drainageways on moraines, drainageways on outwash plains, depressions on outwash plains, depressions on till plains, swamps on outwash plains, swamps on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

Gilford, gravelly subsoil

Percent of map unit: 1 percent
Landform: Glacial drainage channels, glacial drainage channels
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA020MI - Wet Sandy Drift Depressions
Hydric soil rating: Yes

HgtanA—Houghton muck, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 30n5d
Elevation: 650 to 1,070 feet
Mean annual precipitation: 35 to 41 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Houghton, undrained, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton, Undrained

Setting

Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 79 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very high (about 24.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Minor Components

Palms, undrained

Percent of map unit: 8 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

Muskego, undrained

Percent of map unit: 7 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB002IN - Limnic Muck
Hydric soil rating: Yes

IaA—Ionia loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4j
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ionia and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ionia

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

IaB—Ionia loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b4k
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ionia and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ionia

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

KaC—Kendallville loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b4l
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

KaC2—Kendallville loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b4m
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

KbC—Kendallville sandy loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b4n
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

KcC2—Kendallville soils, 7 to 15 percent slopes, moderately or severely eroded

Map Unit Setting

National map unit symbol: 6b4p
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: clay loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge

Hydric soil rating: No

KdA—Kerston muck and loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4q
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Kerston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kerston

Setting

Landform: Depressions on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over alternating layers of alluvium and/or organic material

Typical profile

Oa1 - 0 to 8 inches: muck
Oa2 - 8 to 15 inches: muck
H3 - 15 to 42 inches: stratified fine sand to silty clay loam
O'a - 42 to 50 inches: muck
H5 - 50 to 60 inches: stratified fine sand to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 14.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

KeA—Kibbie and Colwood fine sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4r
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Kibbie and similar soils: 51 percent
Colwood and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kibbie

Setting

Landform: Knolls on deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

KeB—Kibbie and Colwood fine sandy loams, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b4s
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Kibbie and similar soils: 51 percent
Colwood and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kibbie

Setting

Landform: Knolls on deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None

Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

KfA—Kokomo and Barry loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4t
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Kokomo and similar soils: 51 percent
Barry and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kokomo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 31 inches: silty clay loam
H3 - 31 to 60 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent

Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Barry

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

KgA—Kokomo, Barry, and Wallkill loams, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4v
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 55 degrees F

Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kokomo and similar soils: 40 percent
Barry and similar soils: 30 percent
Wallkill and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kokomo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 31 inches: silty clay loam
H3 - 31 to 60 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Barry

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Wallkill

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over organic material

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: fine sandy loam
Oa - 20 to 60 inches: muck

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 19.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

LcA—Linwood muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4y
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 32 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Linwood and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Linwood

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Woody organic material over loamy till

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 31 inches: muck
H3 - 31 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 17.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

Le—Lenawee silty clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2wcf7
Elevation: 560 to 980 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 230 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Lenawee and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lenawee

Setting

Landform: Lakebeds (relict)
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey glaciolacustrine deposits

Typical profile

Ap - 0 to 9 inches: silty clay loam
Bg - 9 to 39 inches: silty clay loam
Cg - 39 to 80 inches: silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 21 percent
Maximum salinity: Nonsaline (0.0 to 0.6 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Del rey

Percent of map unit: 7 percent
Landform: Lakebeds (relict)
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Linear, convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

MaA—Macomb fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b50
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Macomb and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Macomb

Setting

Landform: Drainageways on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 32 inches: sandy clay loam
H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent

Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

MbA—Macomb sandy clay loam and Hoytville clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b51
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Macomb and similar soils: 51 percent
Hoytville and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Macomb

Setting

Landform: Drainageways on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 32 inches: sandy clay loam
H3 - 32 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

McA—Maumee loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b52
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Maumee and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Maumee

Setting

Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy glaciofluvial deposits and/or sandy glaciolacustrine deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 60 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

MfD3—Miami soils, 15 to 25 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 6b5f
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 141 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Miami, severely eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami, Severely Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: clay loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

MhA—Morley loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b5j
Elevation: 580 to 1,400 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Morley and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhB—Glynwood loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2v4bq
Elevation: 700 to 1,060 feet

Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 31 inches: clay
BC - 31 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 28 to 45 inches to densic material
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Rawson

Percent of map unit: 6 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge

Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhB2—Glynwood loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2v4br
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 7 inches: loam
Bt - 7 to 26 inches: clay
BC - 26 to 30 inches: clay loam

Cd - 30 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 25 to 37 inches to densic material
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Rawson

Percent of map unit: 6 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhC—Morley loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2wp25
Elevation: 570 to 1,120 feet
Mean annual precipitation: 32 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till

Typical profile

Ap - 0 to 9 inches: loam
Bt1 - 9 to 18 inches: clay
Bt2 - 18 to 29 inches: clay
BC - 29 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 26 to 40 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C

Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood
Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount
Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo
Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhC2—Morley loam, 6 to 12 percent slopes, eroded

Map Unit Setting
National map unit symbol: 2wp26
Elevation: 750 to 1,220 feet
Mean annual precipitation: 32 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 165 days
Farmland classification: Farmland of local importance

Map Unit Composition
Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 17 inches: clay
Bt2 - 17 to 28 inches: clay
BC - 28 to 33 inches: clay loam
Cd - 33 to 79 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 24 to 38 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood

Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear

Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhD—Morley loam, 12 to 25 percent slopes

Map Unit Setting

National map unit symbol: 6b5p
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MhD2—Morley loam, 12 to 25 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b5q
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Moderately Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MhE—Morley loam, 25+ percent slopes

Map Unit Setting
National map unit symbol: 6b5r
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Morley and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile
H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities
Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MkB3—Glynwood clay loam, 2 to 6 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 2t6ln
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Glynwood, severely eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood, Severely Eroded

Setting

Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 6 inches: clay loam
Bt - 6 to 20 inches: clay
BC - 20 to 25 inches: clay loam
Cd - 25 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 36 inches to densic material
Drainage class: Moderately well drained
Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Rawson, severely eroded

Percent of map unit: 6 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MkC3—Morley soils, 7 to 15 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 6b5t
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley, severely eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Severely Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MkD3—Morley clay loam, 12 to 18 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 2wvhl
Elevation: 720 to 1,120 feet
Mean annual precipitation: 35 to 40 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 160 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley, severely eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Severely Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 7 inches: clay loam
Bt - 7 to 25 inches: clay
BC - 25 to 33 inches: clay loam
Cd - 33 to 79 inches: clay loam

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: 26 to 45 inches to densic material
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hennepin, severely eroded
Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Glynwood, severely eroded
Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount
Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

MkE2—Morley soils, 25+ percent slopes, moderately or severely eroded

Map Unit Setting
National map unit symbol: 6b5w
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Morley, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Moderately Eroded

Setting
Landform: Moraines

Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MmA—Metamora sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 68ts
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Metamora and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Metamora

Setting

Landform: Knolls on till plains

Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 21 inches: sandy loam
H3 - 21 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Blount

Percent of map unit: 4 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Selfridge

Percent of map unit: 4 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Corunna

Percent of map unit: 4 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats

Hydric soil rating: Yes

Pewamo

Percent of map unit: 3 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

NaA—Nappanee silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b5x
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent

Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

NaB—Nappanee silt loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b5y
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

NaB2—Nappanee silt loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b5z
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee, Moderately Eroded

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear

Across-slope shape: Convex
Parent material: Clayey till

Typical profile
H1 - 0 to 7 inches: silt loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities
Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Hoytville
Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

NbB—Nappanee loam, 3 to 7 percent slopes

Map Unit Setting
National map unit symbol: 6b60
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Nappanee and similar soils: 95 percent

Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

NbB2—Nappanee loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b61
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee, Moderately Eroded

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

OaA—Ogden muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b62
Elevation: 600 to 1,500 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Ogden and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ogden

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

Oa - 0 to 30 inches: muck
H2 - 30 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Very high (about 16.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

ObA—Oshtemo loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b63
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Oshtemo and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oshtemo

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy and/or sandy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: loamy sand
H2 - 14 to 45 inches: sandy loam
H3 - 45 to 60 inches: stratified sand to gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A

Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

ObB—Oshtemo loamy sand, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b64
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Oshtemo and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oshtemo

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy and/or sandy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: loamy sand
H2 - 14 to 45 inches: sandy loam
H3 - 45 to 60 inches: stratified gravelly sand to sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

OcC—Ottawa loamy sand, 7 to 15 percent slopes, slightly or moderately eroded

Map Unit Setting

National map unit symbol: 6b67
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Ottawa and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ottawa

Setting

Landform: Beaches on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Glaciofluvial deposits and/or sandy glaciolacustrine deposits over loamy till

Typical profile

H1 - 0 to 35 inches: loamy sand
H2 - 35 to 50 inches: fine sand
H3 - 50 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

OkB—Oakville fine sand, loamy substratum, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 68vj
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Oakville, loamy substratum, and similar soils: 88 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oakville, Loamy Substratum

Setting

Landform: Outwash deltas on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy eolian deposits over loamy till

Typical profile

H1 - 0 to 9 inches: fine sand
H2 - 9 to 52 inches: fine sand
H3 - 52 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Tedrow

Percent of map unit: 6 percent

Landform: Outwash deltas, knolls
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Thetford

Percent of map unit: 6 percent
Landform: Outwash deltas, knolls
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

OtB—Ottokee fine sand, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 68vk
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Ottokee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ottokee

Setting

Landform: Knolls on outwash deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: fine sand
H2 - 9 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Granby

Percent of map unit: 5 percent
Landform: Depressions on outwash deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY011MI - Warm Wet Sandy Depression
Hydric soil rating: Yes

PaA—Palms muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b68
Elevation: 250 to 1,500 feet
Mean annual precipitation: 30 to 45 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Palms and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Palms

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material and/or loamy till

Typical profile

Oa1 - 0 to 13 inches: muck
Oa2 - 13 to 32 inches: muck
H3 - 32 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Very high (about 17.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

PbA—Pewamo clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t6lz
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 205 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on till plains, drainageways on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 11 inches: clay loam
Btg1 - 11 to 34 inches: clay
Btg2 - 34 to 47 inches: clay loam
BCg - 47 to 57 inches: clay loam
Cg - 57 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 8 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Brookston

Percent of map unit: 4 percent
Landform: Drainageways on till plains, depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Palms, undrained

Percent of map unit: 3 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

PcA—Pewamo mucky clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6b
Elevation: 600 to 1,400 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Pewamo and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: mucky silty clay loam
H2 - 7 to 32 inches: clay loam
H3 - 32 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

PdA—Plainfield and Berrien loamy sands, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6c
Elevation: 600 to 1,150 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 51 percent
Berrien and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains

Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

PdB—Plainfield and Berrien loamy sands, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b6d
Elevation: 600 to 1,150 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 51 percent
Berrien and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise

Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile
H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities
Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups
Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Description of Berrien

Setting
Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile
H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities
Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

PeA—Plainfield and Ottawa loamy sands, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6f
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PeB—Plainfield and Ottawa loamy sands, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b6g
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PeB2—Plainfield and Ottawa loamy sands, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6h
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield, Moderately Eroded

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PeC—Plainfield and Ottawa loamy sands, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b6j
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Beach ridges
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PeC2—Plainfield and Ottawa loamy sands, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6k
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield, Moderately Eroded

Setting

Landform: Beach ridges
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PwmaaA—Pewamo clay loam, dense substratum, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2qz3f
Elevation: 670 to 830 feet
Mean annual precipitation: 31 to 36 inches
Mean annual air temperature: 47 to 49 degrees F
Frost-free period: 143 to 182 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo, dense substratum, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo, Dense Substratum

Setting

Landform: Drainageways on nearshore zones (relict), flats on nearshore zones (relict)
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over dense till

Typical profile

Ap - 0 to 11 inches: clay loam
Btg - 11 to 39 inches: clay loam
BCg - 39 to 56 inches: clay loam
2Cd - 56 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 30 to 70 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Metamora, dense substratum
Percent of map unit: 12 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Blount
Percent of map unit: 4 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Gilford, loamy substratum
Percent of map unit: 2 percent
Landform: Drainageways on nearshore zones (relict), depressions on nearshore zones (relict)
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Selfridge, dense substratum
Percent of map unit: 2 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

RaA—Rifle peat, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b6l
Elevation: 810 to 850 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 130 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Rifle and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rifle

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Woody organic material

Typical profile

Oa - 0 to 14 inches: muck
Oe - 14 to 60 inches: mucky peat

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

RbA—Rollin muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6m
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Rollin and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rollin

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over marl

Typical profile

Oa - 0 to 30 inches: muck
Lma - 30 to 60 inches: marly material

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 90 percent
Available water supply, 0 to 60 inches: Very high (about 15.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

SbA—Sebewa sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6p
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Sebewa and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sebewa

Setting

Landform: Depressions on glacial drainage channels
Landform position (three-dimensional): Talf

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 30 inches: sandy clay loam
H3 - 30 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

SdC—St. Clair loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b6w
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

St. clair and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest

Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

SdC2—St. Clair loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6x
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

St. clair, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair, Moderately Eroded

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

SdD2—St. Clair loam, 12 to 25 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6y
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

St. clair, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair, Moderately Eroded

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge

Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

SeC3—St. Clair soils, 7 to 15 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 6b71
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

St. clair, severely eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair, Severely Eroded

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: clay loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

Sf—Sebewa loam, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2v4bw
Elevation: 570 to 1,070 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 110 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Sebewa and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sebewa

Setting

Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave

Parent material: Loamy drift over sandy and gravelly outwash

Typical profile

Ap - 0 to 11 inches: loam
Btg1 - 11 to 21 inches: clay loam
Btg2 - 21 to 33 inches: clay loam
2Cg - 33 to 79 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 23 to 39 inches to strongly contrasting textural stratification
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 45 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 3.0
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways, drainageways on stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Gilford

Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Sg—Sewage lagoons

Map Unit Composition

Sewage lagoons: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

TaA—Tawas muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b72
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Tawas and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tawas

Setting

Landform: Depressions on strand plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Woody organic material over sandy glaciofluvial deposits

Typical profile

Oa - 0 to 28 inches: muck
H2 - 28 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Very high (about 13.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

ThA—Thetford loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 68v7
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Farmland of local importance

Map Unit Composition

Thetford and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Thetford

Setting

Landform: Knolls on outwash deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: loamy sand
H2 - 9 to 15 inches: sand
H3 - 15 to 38 inches: sand
H4 - 38 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: F099XY003MI - Warm Moist Sandy Depression

Hydric soil rating: No

Minor Components

Spinks

Percent of map unit: 5 percent
Landform: Knolls on outwash deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Ud—Udorthents, nearly level and undulating

Map Unit Setting

National map unit symbol: 1bxsy
Elevation: 580 to 1,110 feet
Mean annual precipitation: 27 to 32 inches
Mean annual air temperature: 43 to 46 degrees F
Frost-free period: 95 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Landform: Moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 80 inches: silty clay loam

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Hydrologic Soil Group: C
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

WaA—Wallkill loam, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b73
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Wallkill and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wallkill

Setting

Landform: Depressions on flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over organic material

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: fine sandy loam
Oa - 20 to 60 inches: muck

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent

Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 19.6 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

WawabB—Wawasee loam, 2 to 6 percent slopes

Map Unit Setting
National map unit symbol: 2wp1x
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile
Ap - 0 to 9 inches: loam
Bt1 - 9 to 24 inches: loam
Bt2 - 24 to 33 inches: clay loam
C - 33 to 79 inches: loam

Properties and qualities
Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawabC—Wawasee loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2wvgl
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines

Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 24 inches: loam
Bt2 - 24 to 33 inches: clay loam
C - 33 to 79 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawacB—Wawasee loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvgk
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 24 inches: loam
Bt2 - 24 to 32 inches: clay loam
C - 32 to 79 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains

Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawacC—Wawasee loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvgm
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 7 inches: loam

Bt1 - 7 to 23 inches: loam
Bt2 - 23 to 31 inches: clay loam
C - 31 to 79 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawadD—Wawasee loam, 12 to 25 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvgr

Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Wawasee and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 7 inches: loam
Bt1 - 7 to 23 inches: loam
Bt2 - 23 to 31 inches: clay loam
C - 31 to 79 inches: loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 6 percent
Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 4 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WcA—Wauseon loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b75
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Wauseon and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wauseon

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent

Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

WdA—Willette muck, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b76
Elevation: 600 to 1,500 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition
Willette and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Willette

Setting
Landform: Depressions, depressions
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Organic material over loamy till and/or lacustrine deposits

Typical profile
Oa - 0 to 30 inches: muck
H2 - 30 to 60 inches: silty clay

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Very high (about 16.2 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: C/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

ZfsacA—Ziegenfuss clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2qz3g
Elevation: 570 to 790 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Ziegenfuss and similar soils: 86 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ziegenfuss

Setting

Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over loamy till

Typical profile

Ap - 0 to 9 inches: clay loam
Bg - 9 to 30 inches: clay loam
BC - 30 to 40 inches: clay loam
C - 40 to 67 inches: clay loam
2Cd - 67 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 60 to 80 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 28 percent
Maximum salinity: Nonsaline (0.1 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 9 percent
Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Houcktown

Percent of map unit: 5 percent
Landform: Wave-worked till plains
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Monroe County, Michigan

16A—Tedrow loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 68tk
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Farmland of local importance

Map Unit Composition

Tedrow and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tedrow

Setting

Landform: Knolls on outwash deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: loamy sand
H2 - 8 to 54 inches: loamy sand
H3 - 54 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A/D
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

18—Granby loamy fine sand

Map Unit Setting

National map unit symbol: 68tm
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Granby and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Granby

Setting

Landform: Depressions on outwash deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 10 inches: loamy fine sand
H2 - 10 to 30 inches: fine sand
H3 - 30 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F099XY011MI - Warm Wet Sandy Depression
Hydric soil rating: Yes

Minor Components

Belleville

Percent of map unit: 5 percent

Landform: Outwash deltas on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY011MI - Warm Wet Sandy Depression
Hydric soil rating: Yes

19A—Selfridge loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2whvw
Elevation: 540 to 830 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Selfridge and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Selfridge

Setting

Landform: Wave-worked till plains, nearshore zones (relict), water-lain moraines, glacial drainage channels, deltas
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Parent material: Sandy and loamy glaciolacustrine deposits over loamy till

Typical profile

Ap - 0 to 9 inches: loamy sand
E - 9 to 17 inches: sand
Bw - 17 to 27 inches: sand
Bt1 - 27 to 30 inches: sandy loam
2Bt2 - 30 to 35 inches: clay loam
2Cg - 35 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY005MI - Cool Moist Sandy Depression
Hydric soil rating: No

Minor Components

Belleville

Percent of map unit: 5 percent
Landform: Nearshore zones (relict), wave-worked till plains, water-lain moraines, glacial drainage channels, deltas
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Microfeatures of landform position: Open depressions
Down-slope shape: Linear, concave
Across-slope shape: Concave
Ecological site: F099XY012MI - Cool Wet Sandy Depression
Hydric soil rating: Yes

Parkhill

Percent of map unit: 3 percent
Landform: Wave-worked till plains, deltas, glacial drainage channels, water-lain moraines, nearshore zones (relict)
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Microfeatures of landform position: Open depressions
Down-slope shape: Linear, concave
Across-slope shape: Concave
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Capac

Percent of map unit: 2 percent
Landform: Nearshore zones (relict), wave-worked till plains, water-lain moraines, glacial drainage channels, deltas
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

23A—Metamora sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 68ts
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Metamora and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Metamora

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 21 inches: sandy loam
H3 - 21 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Selfridge
Percent of map unit: 4 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Corunna
Percent of map unit: 4 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Blount
Percent of map unit: 4 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Pewamo
Percent of map unit: 3 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

24—Corunna sandy loam

Map Unit Setting
National map unit symbol: 68tt
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Corunna and similar soils: 85 percent

Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Corunna

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Selfridge

Percent of map unit: 5 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Metamora

Percent of map unit: 5 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Belleville

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY011MI - Warm Wet Sandy Depression
Hydric soil rating: Yes

40A—Thetford loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 68v7
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Farmland of local importance

Map Unit Composition

Thetford and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Thetford

Setting

Landform: Knolls on outwash deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: loamy sand
H2 - 9 to 15 inches: sand
H3 - 15 to 38 inches: sand
H4 - 38 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Spinks

Percent of map unit: 5 percent
Landform: Knolls on outwash deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

49B—Oakville fine sand, loamy substratum, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 68vj
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Oakville, loamy substratum, and similar soils: 88 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oakville, Loamy Substratum

Setting

Landform: Outwash deltas on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy eolian deposits over loamy till

Typical profile

H1 - 0 to 9 inches: fine sand
H2 - 9 to 52 inches: fine sand
H3 - 52 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Thetford

Percent of map unit: 6 percent
Landform: Outwash deltas, knolls
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Tedrow

Percent of map unit: 6 percent
Landform: Outwash deltas, knolls
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

50B—Ottokee fine sand, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 68vk
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Ottokee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ottokee

Setting

Landform: Knolls on outwash deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: fine sand
H2 - 9 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Granby

Percent of map unit: 5 percent
Landform: Depressions on outwash deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY011MI - Warm Wet Sandy Depression
Hydric soil rating: Yes

55—Gilford sandy loam

Map Unit Setting

National map unit symbol: 68vn
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F

Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Gilford and similar soils: 88 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gilford

Setting

Landform: Depressions on outwash deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy over sandy glaciofluvial deposits

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 28 inches: sandy loam
H3 - 28 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Granby

Percent of map unit: 12 percent
Landform: Depressions on outwash deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY011MI - Warm Wet Sandy Depression
Hydric soil rating: Yes

112A—Wauseon loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b75
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Wauseon and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wauseon

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

ZfsacA—Ziegenfuss clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2qz3g
Elevation: 570 to 790 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Ziegenfuss and similar soils: 86 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ziegenfuss

Setting

Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over loamy till

Typical profile

Ap - 0 to 9 inches: clay loam
Bg - 9 to 30 inches: clay loam
BC - 30 to 40 inches: clay loam
C - 40 to 67 inches: clay loam
2Cd - 67 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 60 to 80 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 28 percent
Maximum salinity: Nonsaline (0.1 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 9 percent
Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Houcktown

Percent of map unit: 5 percent
Landform: Wave-worked till plains
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

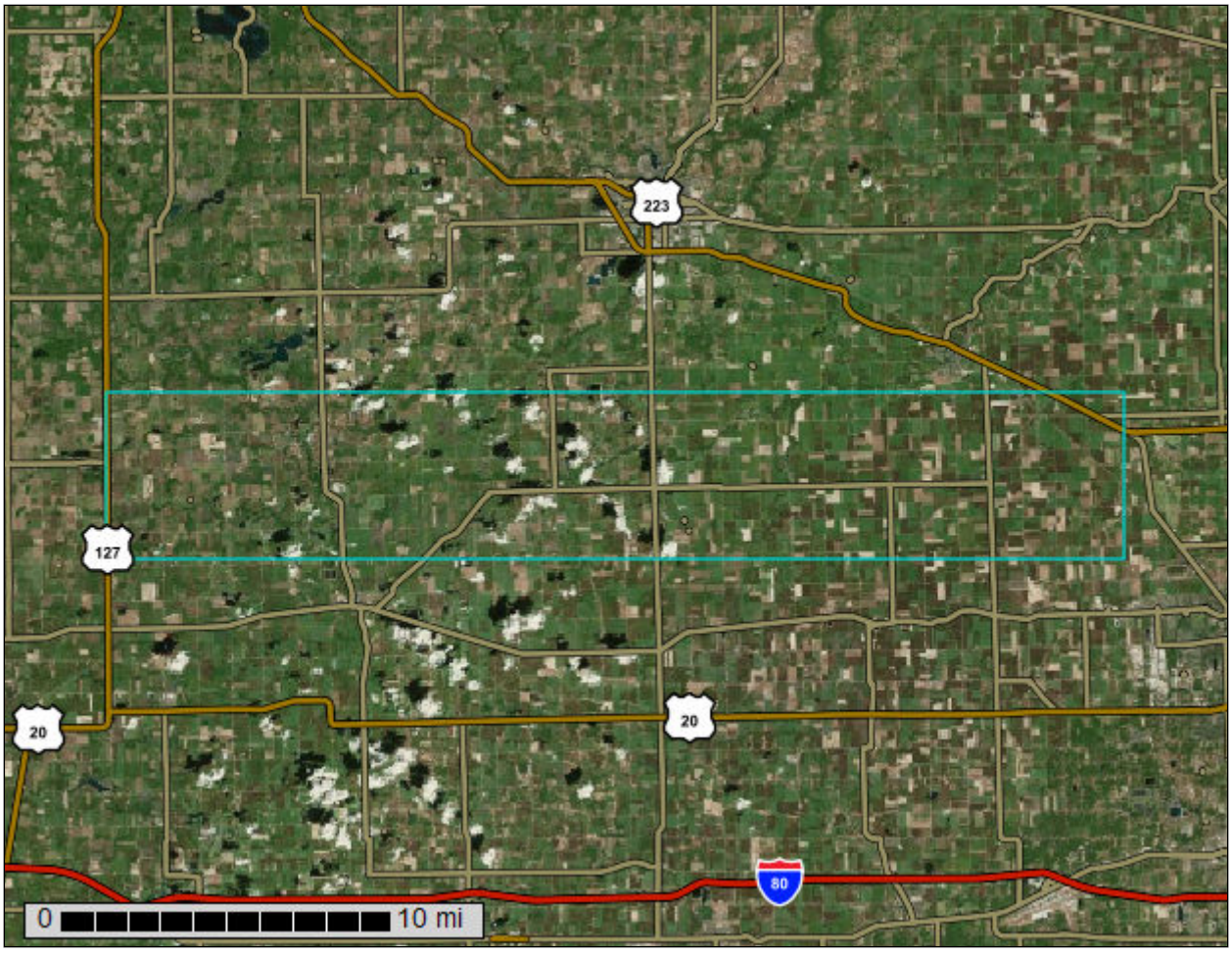
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Hillsdale County, Michigan, Lenawee County, Michigan, and Monroe County, Michigan



June 13, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

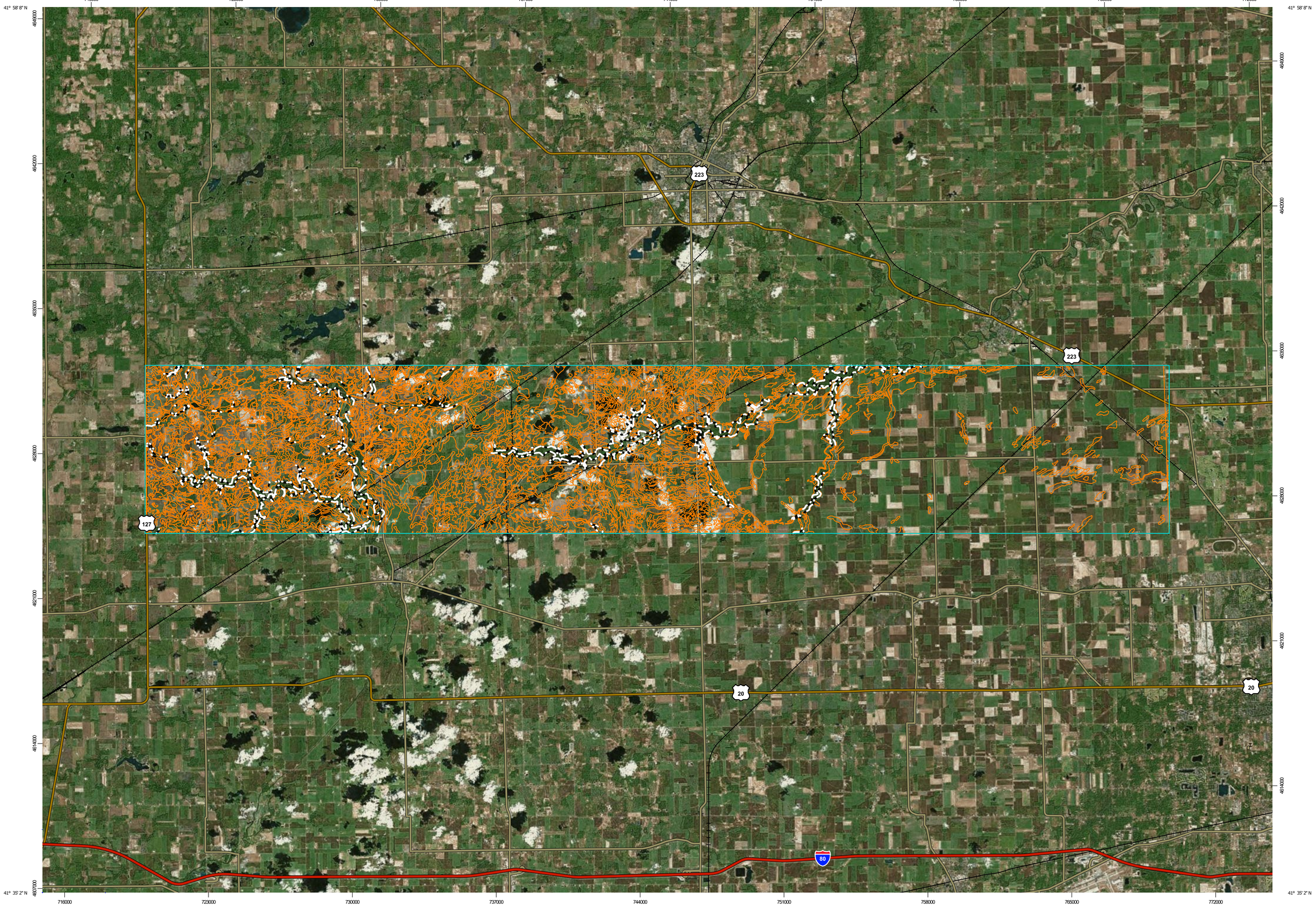
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



Map Scale: 1:120,000 if printed on C landscape (22" x 17") sheet.

N

0 1500 3000 6000 9000 Meters

0 5000 10000 20000 30000 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:15,800 to 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hillsdale County, Michigan
Survey Area Data: Version 22, Aug 27, 2024

Soil Survey Area: Lenawee County, Michigan
Survey Area Data: Version 20, Aug 27, 2024

Soil Survey Area: Monroe County, Michigan
Survey Area Data: Version 22, Aug 27, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 7, 2019—Jun 18, 2023

MAP LEGEND

MAP INFORMATION

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
18B	Glynwood-Blount complex, 1 to 6 percent slopes	60.9	0.1%
18C2	Morley loam, 6 to 12 percent slopes, eroded	9.3	0.0%
18D2	Morley clay loam, 12 to 18 percent slopes, eroded	0.5	0.0%
19B	Blount loam, 0 to 4 percent slopes	23.4	0.0%
20	Pewamo silt loam	7.1	0.0%
29B	Steamburg sandy loam, 2 to 6 percent slopes	0.7	0.0%
32	Sloan silt loam, 0 to 1 percent slopes, frequently flooded	2.0	0.0%
46	Wallkill silt loam	1.5	0.0%
Subtotals for Soil Survey Area		**105.6**	**0.1%**
Totals for Area of Interest		**99,789.4**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AaA	Adrian muck, 0 to 3 percent slopes	15.3	0.0%
BaA	Barry sandy loam, overwashed, 0 to 3 percent slopes	9.4	0.0%
BbB	Berrien loamy sand, 3 to 7 percent slopes	26.9	0.0%
BbB2	Berrien loamy sand, 3 to 7 percent slopes, moderately eroded	0.6	0.0%
BcA	Berrien sandy loam, 0 to 3 percent slopes	22.1	0.0%
BcB	Berrien sandy loam, 3 to 7 percent slopes	297.5	0.3%
BcB2	Berrien sandy loam, 3 to 7 percent slopes, moderately eroded	24.6	0.0%
BcC	Berrien sandy loam, 7 to 15 percent slopes	7.1	0.0%
BdA	Berville loam, 0 to 3 percent slopes	108.9	0.1%
BeA	Berville sandy loam, 0 to 3 percent slopes	76.9	0.1%
BgA	Blount loam and Pewamo clay loam, 0 to 3 percent slopes	2,532.0	2.5%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BhA	Brady sandy loam, 0 to 3 percent slopes	439.9	0.4%
BkA	Brady and Macomb loams, 0 to 3 percent slopes	2,439.0	2.4%
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	145.4	0.1%
BnA	Bronson sandy loam, 0 to 3 percent slopes	1,022.9	1.0%
BnB	Bronson sandy loam, 3 to 7 percent slopes	125.1	0.1%
BntaaA	Blount loam, 0 to 2 percent slopes	2,562.4	2.6%
BntaaB	Blount loam, 2 to 6 percent slopes	2,586.5	2.6%
BntabB	Blount loam, 2 to 6 percent slopes, eroded	397.9	0.4%
BoA	Brookston loam, 0 to 3 percent slopes	711.7	0.7%
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	1,071.1	1.1%
CaB	Cadmus loam, 3 to 7 percent slopes	777.2	0.8%
CaB2	Cadmus loam, 3 to 7 percent slopes, moderately eroded	61.9	0.1%
CaracA	Carlisle muck, disintegration moraine, 0 to 2 percent slopes	518.2	0.5%
CbA	Cadmus sandy loam, 0 to 3 percent slopes	191.8	0.2%
CbB	Cadmus sandy loam, 3 to 7 percent slopes	496.8	0.5%
CbB2	Cadmus sandy loam, 3 to 7 percent slopes, moderately eroded	55.2	0.1%
CcA	Cadmus and Blount loams, 0 to 3 percent slopes	608.3	0.6%
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	273.1	0.3%
CgA	Conover loam, 0 to 3 percent slopes	252.8	0.3%
CgB	Conover loam, 3 to 7 percent slopes	80.6	0.1%
CgB2	Conover loam, 3 to 7 percent slopes, moderately eroded	25.9	0.0%
EaA	Edwards muck, 0 to 3 percent slopes	300.8	0.3%
FbA	Fox loam, 0 to 3 percent slopes	10.4	0.0%
FbB	Fox loam, 3 to 7 percent slopes	104.7	0.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
FbC2	Fox loam, 7 to 15 percent slopes, moderately eroded	46.8	0.0%
FcA	Fox sandy loam, till plain, 0 to 2 percent slopes	343.6	0.3%
FcB	Fox sandy loam, till plain, 2 to 6 percent slopes	260.3	0.3%
FcB2	Fox sandy loam, 3 to 7 percent slopes, moderately eroded	74.1	0.1%
FcC	Fox sandy loam, Huron Lobe, 6 to 12 percent slopes	3.0	0.0%
FcC2	Fox sandy loam, Huron Lobe, 6 to 12 percent slopes, eroded	88.9	0.1%
FcD	Fox sandy loam, Huron Lobe, 12 to 25 percent slopes	3.6	0.0%
FcD2	Fox sandy loam, 12 to 25 percent slopes, moderately eroded	17.8	0.0%
FdC3	Fox soils, 7 to 15 percent slopes, severely eroded	5.0	0.0%
GaA	Genesee loam, 0 to 2 percent slopes, occasionally flooded	40.9	0.0%
GbA	Genesee sandy loam, 0 to 3 percent slopes	16.4	0.0%
GbB	Genesee sandy loam, 3 to 7 percent slopes	4.6	0.0%
GcA	Genesee and Eel loams, 0 to 3 percent slopes	352.0	0.4%
GeA	Granby sandy loam, 0 to 3 percent slopes	100.2	0.1%
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	1,980.1	2.0%
GgA	Griffin and Sloan loams, 0 to 3 percent slopes	91.8	0.1%
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	2,086.5	2.1%
Gp	Gravel pits	35.4	0.0%
HcA	Hoytville clay loam and silty clay loam, 0 to 3 percent slopes	306.7	0.3%
HeA	Hoytville clay loam and Rimer sandy loam, 0 to 3 percent slopes	108.1	0.1%
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	1,094.0	1.1%
HgtanA	Houghton muck, disintegration moraine, 0 to 2 percent slopes	289.1	0.3%
IaA	Ionia loam, 0 to 3 percent slopes	282.0	0.3%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
IaB	Ionia loam, 3 to 7 percent slopes	94.2	0.1%
KaC	Kendallville loam, 7 to 15 percent slopes	66.9	0.1%
KaC2	Kendallville loam, 7 to 15 percent slopes, moderately eroded	18.1	0.0%
KbC	Kendallville sandy loam, 7 to 15 percent slopes	76.0	0.1%
KcC2	Kendallville soils, 7 to 15 percent slopes, moderately or severely eroded	15.0	0.0%
KdA	Kerston muck and loams, 0 to 3 percent slopes	201.9	0.2%
KfA	Kokomo and Barry loams, 0 to 3 percent slopes	377.6	0.4%
KgA	Kokomo, Barry, and Wallkill loams, overwashed, 0 to 3 percent slopes	180.5	0.2%
LaA	Lake borders	25.3	0.0%
LcA	Linwood muck, 0 to 3 percent slopes	31.9	0.0%
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	352.0	0.4%
MbA	Macomb sandy clay loam and Hoytville clay loam, 0 to 3 percent slopes	2,407.3	2.4%
McA	Maumee loamy sand, 0 to 3 percent slopes	38.2	0.0%
MhA	Morley loam, 0 to 3 percent slopes	366.3	0.4%
MhB	Glynwood loam, 2 to 6 percent slopes	1,498.8	1.5%
MhB2	Glynwood loam, 2 to 6 percent slopes, eroded	7,083.5	7.1%
MhC	Morley loam, 6 to 12 percent slopes	217.1	0.2%
MhC2	Morley loam, 6 to 12 percent slopes, eroded	2,822.7	2.8%
MhD	Morley loam, 12 to 25 percent slopes	54.1	0.1%
MhD2	Morley loam, 12 to 25 percent slopes, moderately eroded	307.8	0.3%
MhE	Morley loam, 25+ percent slopes	25.9	0.0%
MkC3	Morley soils, 7 to 15 percent slopes, severely eroded	319.8	0.3%
MkD3	Morley clay loam, 12 to 18 percent slopes, severely eroded	144.9	0.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MkE2	Morley soils, 25+ percent slopes, moderately or severely eroded	6.7	0.0%
MmA	Metamora sandy loam, 0 to 3 percent slopes	5.4	0.0%
NaA	Nappanee silt loam, 0 to 3 percent slopes	5,149.8	5.2%
NaB	Nappanee silt loam, 3 to 7 percent slopes	111.9	0.1%
NaB2	Nappanee silt loam, 3 to 7 percent slopes, moderately eroded	3.1	0.0%
NbA	Nappanee loam, 0 to 3 percent slopes	17.8	0.0%
NbB	Nappanee loam, 3 to 7 percent slopes	2,014.4	2.0%
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	2,094.8	2.1%
OaA	Ogden muck, 0 to 3 percent slopes	33.9	0.0%
ObB2	Oshtemo loamy sand, 3 to 7 percent slopes, moderately eroded	7.9	0.0%
ObC	Oshtemo loamy sand, 7 to 15 percent slopes	2.7	0.0%
PaA	Palms muck, 0 to 3 percent slopes	15.1	0.0%
PbA	Pewamo clay loam, 0 to 2 percent slopes	3,615.5	3.6%
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	575.6	0.6%
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	208.6	0.2%
PdB	Plainfield and Berrien loamy sands, 3 to 7 percent slopes	236.4	0.2%
PeB	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes	29.9	0.0%
PeB2	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes, moderately eroded	41.8	0.0%
PeC	Plainfield and Ottawa loamy sands, 7 to 15 percent slopes	4.0	0.0%
PeC2	Plainfield and Ottawa loamy sands, 7 to 15 percent slopes, moderately eroded	1.8	0.0%
PwmaaA	Pewamo clay loam, dense substratum, 0 to 1 percent slopes	499.8	0.5%
RaA	Rifle peat, 0 to 3 percent slopes	15.1	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
SdC	St. Clair loam, 7 to 15 percent slopes	28.6	0.0%
SdC2	St. Clair loam, 7 to 15 percent slopes, moderately eroded	224.2	0.2%
SdD2	St. Clair loam, 12 to 25 percent slopes, moderately eroded	156.0	0.2%
SeC3	St. Clair soils, 7 to 15 percent slopes, severely eroded	44.4	0.0%
Sf	Sebewa loam, disintegration moraine, 0 to 2 percent slopes	119.3	0.1%
Sg	Sewage lagoons	17.3	0.0%
W	Water	138.8	0.1%
WaA	Wallkill loam, overwashed, 0 to 3 percent slopes	41.9	0.0%
WawabB	Wawasee loam, 2 to 6 percent slopes	64.1	0.1%
WawabC	Wawasee loam, 6 to 12 percent slopes	65.4	0.1%
WawacB	Wawasee loam, 2 to 6 percent slopes, eroded	35.9	0.0%
WawacC	Wawasee loam, 6 to 12 percent slopes, eroded	45.9	0.0%
WawadD	Wawasee loam, 12 to 25 percent slopes, eroded	7.4	0.0%
WcA	Wauseon loam, 0 to 3 percent slopes	1,966.9	2.0%
WdA	Willette muck, 0 to 3 percent slopes	36.0	0.0%
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	38,639.7	38.7%
Subtotals for Soil Survey Area		**99,061.3**	**99.3%**
Totals for Area of Interest		**99,789.4**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
23A	Metamora sandy loam, 0 to 3 percent slopes	12.5	0.0%
43A	Nappanee loam, 0 to 3 percent slopes	15.9	0.0%
100A	Hoytville and Wauseon loams, 0 to 3 percent slopes	4.8	0.0%
112A	Wauseon loam, 0 to 3 percent slopes	10.8	0.0%
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	227.5	0.2%
Subtotals for Soil Survey Area		**271.6**	**0.3%**
Totals for Area of Interest		**99,789.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas

shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Hillsdale County, Michigan

18B—Glynwood-Blount complex, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 6b8v
Elevation: 580 to 1,530 feet
Mean annual precipitation: 29 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Glynwood and similar soils: 57 percent
Blount and similar soils: 37 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 26 inches: clay loam
H3 - 26 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Description of Blount

Setting

Landform: Knolls on ground moraines

Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 32 inches: silty clay loam
H3 - 32 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 3 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Steamburg

Percent of map unit: 3 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

18C2—Morley loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wp26
Elevation: 750 to 1,220 feet
Mean annual precipitation: 32 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 165 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 17 inches: clay
Bt2 - 17 to 28 inches: clay
BC - 28 to 33 inches: clay loam
Cd - 33 to 79 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 24 to 38 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood
Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount
Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo
Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

18D2—Morley clay loam, 12 to 18 percent slopes, eroded

Map Unit Setting
National map unit symbol: 2wvhm
Elevation: 770 to 1,250 feet
Mean annual precipitation: 35 to 39 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition
Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 8 inches: clay loam
Bt1 - 8 to 17 inches: silty clay
Bt2 - 17 to 28 inches: clay
BC - 28 to 33 inches: clay loam
Cd - 33 to 79 inches: clay loam

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: 26 to 45 inches to densic material
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood

Percent of map unit: 8 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear

Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 2 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

19B—Blount loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 2ydcv
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, concave
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 30 inches: silty clay
BC - 30 to 37 inches: clay loam
Cd - 37 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: 26 to 48 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Glynwood

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 6 percent
Landform: Depressions, ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Conover

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Badaxe

Percent of map unit: 2 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

20—Pewamo silt loam

Map Unit Setting

National map unit symbol: 6b90
Elevation: 580 to 1,530 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 11 inches: silt loam
H2 - 11 to 48 inches: clay loam
H3 - 48 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Minor Components

Houghton

Percent of map unit: 1 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Blount

Percent of map unit: 1 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Glynwood

Percent of map unit: 1 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

29B—Steamburg sandy loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 6b95
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Steamburg and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Steamburg

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear

Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 9 inches: sandy loam
H2 - 9 to 34 inches: sandy loam
H3 - 34 to 40 inches: clay loam
H4 - 40 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Fox

Percent of map unit: 3 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Williamstown

Percent of map unit: 2 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Spinks

Percent of map unit: 2 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA014MI - Dry Sandy Drift Plains
Hydric soil rating: No

32—Sloan silt loam, 0 to 1 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2ydd3
Elevation: 520 to 1,340 feet
Mean annual precipitation: 31 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 200 days
Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Sloan, frequently flooded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sloan, Frequently Flooded

Setting

Landform: Depressions on flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy alluvium

Typical profile

Ap - 0 to 12 inches: silt loam
Bg - 12 to 42 inches: silty clay loam
Cg - 42 to 79 inches: stratified gravelly sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: Occasional
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F098XA004MI - Wet Floodplains

Hydric soil rating: Yes

Minor Components

Shoals

Percent of map unit: 6 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA003MI - Moist Floodplains
Hydric soil rating: No

Sloan, frequently flooded, long duration

Percent of map unit: 4 percent
Landform: Depressions on flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F098XA004MI - Wet Floodplains
Hydric soil rating: Yes

46—Wallkill silt loam

Map Unit Setting

National map unit symbol: 6b9t
Elevation: 580 to 1,400 feet
Mean annual precipitation: 28 to 45 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wallkill and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wallkill

Setting

Landform: Depressions on moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over organic material

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 34 inches: silt loam

Oa - 34 to 60 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Occasional
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 16.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

Minor Components

Wolcott

Percent of map unit: 1 percent
Landform: Depressions on moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Houghton

Percent of map unit: 1 percent
Landform: Depressions on moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Pewamo

Percent of map unit: 1 percent
Landform: Depressions on moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Lenawee County, Michigan

AaA—Adrian muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b27
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Adrian and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Adrian

Setting

Landform: Depressions on strand plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over sandy glaciofluvial deposits

Typical profile

Oa - 0 to 32 inches: muck
H2 - 32 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Very high (about 14.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

BaA—Barry sandy loam, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b28
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Barry and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Barry

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: sandy loam
H2 - 12 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BbB—Berrien loamy sand, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2b
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BbB2—Berrien loamy sand, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b2c
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien, Moderately Eroded

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BcA—Berrien sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2d
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

BcB—Berrien sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2f
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

BcB2—Berrien sandy loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b2g
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien, Moderately Eroded

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BcC—Berrien sandy loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b2h
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BdA—Berville loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2j
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Berville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berville

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 24 inches: sandy loam
H3 - 24 to 36 inches: loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BeA—Berville sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2k
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Berville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berville

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 10 inches: sandy loam
H2 - 10 to 24 inches: sandy loam
H3 - 24 to 36 inches: loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BgA—Blount loam and Pewamo clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2q
Elevation: 580 to 1,530 feet
Mean annual precipitation: 29 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 60 percent
Pewamo and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 10 inches: silty clay loam
H3 - 10 to 26 inches: silty clay loam
H4 - 26 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Description of Pewamo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 16 inches: clay loam
H2 - 16 to 32 inches: silty clay loam
H3 - 32 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BhA—Brady sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2r
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Knolls on strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 5 percent
Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BkA—Brady and Macomb loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2s
Elevation: 600 to 1,200 feet

Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 46 percent
Macomb and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Macomb

Setting

Landform: Knolls on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 32 inches: loam

H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 10 percent
Landform: Strand plains, depressions
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BmA—Brady and Macomb sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2t
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 46 percent
Macomb and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Macomb

Setting

Landform: Knolls on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 32 inches: loam
H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BnA—Bronson sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2v
Elevation: 500 to 1,200 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Bronson and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bronson

Setting

Landform: Knolls on strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 38 inches: sandy loam
H3 - 38 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Brookston

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BnB—Bronson sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2w
Elevation: 500 to 1,200 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Bronson and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bronson

Setting

Landform: Knolls on strand plains

Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 38 inches: sandy loam
H3 - 38 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Brookston

Percent of map unit: 5 percent
Landform: Depressions on moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BntaaA—Blount loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wp2k
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, concave
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 30 inches: silty clay
BC - 30 to 37 inches: clay loam
Cd - 37 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 28 to 48 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 6 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Conover

Percent of map unit: 4 percent

Landform: End moraines, ground moraines
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Glynwood

Percent of map unit: 3 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Badaxe

Percent of map unit: 2 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

BntaaB—Blount loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2wp2l
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: End moraines, ground moraines
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 28 inches: silty clay
BC - 28 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 26 to 45 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Glynwood, eroded

Percent of map unit: 8 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Conover

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Depressions on end moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear

Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Badaxe

Percent of map unit: 2 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, convex
Across-slope shape: Linear
Hydric soil rating: No

BntabB—Blount loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wp2m
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount, eroded, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount, Eroded

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 7 inches: loam
Bt - 7 to 24 inches: silty clay
BC - 24 to 30 inches: clay loam
Cd - 30 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 24 to 40 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)

Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Glynwood, eroded

Percent of map unit: 8 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Conover

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Depressions, end moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Badaxe

Percent of map unit: 2 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, convex
Across-slope shape: Linear
Hydric soil rating: No

BoA—Brookston loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2x
Elevation: 500 to 1,020 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Brookston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brookston

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 23 inches: clay loam
H3 - 23 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BpA—Brookston loam, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2y
Elevation: 600 to 900 feet
Mean annual precipitation: 35 to 40 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 150 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Brookston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brookston

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 18 inches: clay loam
H3 - 18 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 11.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

CaB—Cadmus loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2z
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CaB2—Cadmus loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b30
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CaracA—Carlisle muck, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2zdl1
Elevation: 700 to 850 feet
Mean annual precipitation: 35 to 41 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Carlisle and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carlisle

Setting

Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material and/or woody organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 79 inches: woody muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very high (about 24.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Minor Components

Linwood

Percent of map unit: 9 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

Pewamo

Percent of map unit: 6 percent
Landform: Depressions on moraines, drainageways on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

CbA—Cadmus sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b31
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

CbB—Cadmus sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b32
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained

Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CbB2—Cadmus sandy loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting
National map unit symbol: 6b33
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Cadmus, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus, Moderately Eroded

Setting
Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile
H1 - 0 to 14 inches: sandy loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities
Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CcA—Cadmus and Blount loams, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b34
Elevation: 580 to 1,530 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Cadmus and similar soils: 46 percent
Blount and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting
Landform: Knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile
H1 - 0 to 14 inches: loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Description of Blount

Setting

Landform: Knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 10 inches: silty clay loam
H3 - 10 to 26 inches: silty clay loam
H4 - 26 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 10 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

CfA—Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b37
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Colwood and similar soils: 51 percent
Wauseon and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Wauseon

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

CgA—Conover loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b38
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Colwood

Percent of map unit: 5 percent
Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

CgB—Conover loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b39
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches

Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Colwood

Percent of map unit: 5 percent
Landform: Knolls on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

CgB2—Conover loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b3b
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover, Moderately Eroded

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Colwood

Percent of map unit: 5 percent
Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

EaA—Edwards muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b3c
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Edwards and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Edwards

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over marl

Typical profile

Oa - 0 to 24 inches: muck
Lma - 24 to 60 inches: marly material

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 90 percent
Available water supply, 0 to 60 inches: Very high (about 14.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: R111XB002IN - Limnic Muck
Hydric soil rating: Yes

FbA—Fox loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b3h
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FbB—Fox loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b3j
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FbC2—Fox loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b3l
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FcA—Fox sandy loam, till plain, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wvh4
Elevation: 650 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Outwash plains, outwash terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest, tread
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loamy glaciofluvial deposits over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified sand to gravel

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B

Ecological site: R111XC010IN - Well Drained Overflow, F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Matherton
Percent of map unit: 6 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB403IN - Outwash Upland
Hydric soil rating: No

Sebewa
Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

FcB—Fox sandy loam, till plain, 2 to 6 percent slopes

Map Unit Setting
National map unit symbol: 2wvh5
Elevation: 650 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting
Landform: Outwash plains, outwash terraces
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest, tread
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loamy glaciofluvial deposits over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified sand to gravel

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

FcB2—Fox sandy loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b3p
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: sandy loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

FcC—Fox sandy loam, Huron Lobe, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2wvh6
Elevation: 660 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Moraines, outwash plains, ice-contact slopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Loamy till over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified gravelly sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains

Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

FcC2—Fox sandy loam, Huron Lobe, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvh7
Elevation: 660 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox, eroded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Eroded

Setting

Landform: Ice-contact slopes, outwash plains, moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Loamy till over sandy and gravelly outwash

Typical profile

Ap - 0 to 8 inches: sandy loam

Bt1 - 8 to 26 inches: sandy clay loam
Bt2 - 26 to 31 inches: gravelly loam
2C - 31 to 79 inches: stratified gravelly sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R111XC010IN - Well Drained Overflow, F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB403IN - Outwash Upland
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

FcD—Fox sandy loam, Huron Lobe, 12 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2wvh8
Elevation: 650 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Outwash plains, moraines, ice-contact slopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loamy till over sandy and gravelly outwash

Typical profile

A - 0 to 9 inches: sandy loam
Bt1 - 9 to 22 inches: sandy clay loam
Bt2 - 22 to 30 inches: gravelly loam
2C - 30 to 79 inches: stratified gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B

Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Matherton
Percent of map unit: 6 percent
Landform: Drainageways, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sebewa
Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

FcD2—Fox sandy loam, 12 to 25 percent slopes, moderately eroded

Map Unit Setting
National map unit symbol: 6b3t
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition
Fox, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Moderately Eroded

Setting
Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: sandy loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

FdC3—Fox soils, 7 to 15 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 6b3w
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox, severely eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Severely Eroded

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex

Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: clay loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

GaA—Genesee loam, 0 to 2 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: 2z6cv
Elevation: 340 to 1,280 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee, occasionally flooded, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee, Occasionally Flooded

Setting

Landform: Flood-plain steps, natural levees
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

Ap - 0 to 8 inches: loam
Bw - 8 to 32 inches: loam
C - 32 to 79 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 30 to 33 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

Minor Components

Eel, frequently flooded

Percent of map unit: 8 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Sloan, occassionally ponded

Percent of map unit: 7 percent
Landform: Depressions, flood-plain steps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Shoals, occasionally flooded

Percent of map unit: 5 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

GbA—Genesee sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b41
Elevation: 580 to 900 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F099XY008MI - Moist Floodplain
Hydric soil rating: No

GbB—Genesee sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b42
Elevation: 580 to 900 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

GcA—Genesee and Eel loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b43
Elevation: 340 to 900 feet
Mean annual precipitation: 30 to 46 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 120 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee and similar soils: 51 percent
Eel and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

Description of Eel

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: loam
H3 - 20 to 60 inches: stratified sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

GeA—Granby sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b45
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Granby and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Granby

Setting

Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciofluvial deposits and/or sandy glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: fine sand
H3 - 36 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

GfA—Griffin and Genesee loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b46
Elevation: 580 to 1,000 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Genesee and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare

Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

GgA—Griffin and Sloan loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b47
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Sloan and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None

Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Sloan

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 22 inches: clay loam
H3 - 22 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

GhA—Griffin and Sloan sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b48
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Sloan and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Sloan

Setting

Landform: Depressions on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 22 inches: clay loam
H3 - 22 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

Gp—Gravel pits

Map Unit Composition

Gravel pits: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

HcA—Hoytville clay loam and silty clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4d
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silty clay loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

HeA—Hoytville clay loam and Rimer sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4g
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 51 percent
Rimer and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 36 inches: silty clay

H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Rimer

Setting

Landform: Outwash deltas on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy over clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 7 inches: loamy sand
H2 - 7 to 15 inches: fine sand
H3 - 15 to 30 inches: sandy loam
H4 - 30 to 60 inches: clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

HfA—Hoytville and Wauseon loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4h
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 51 percent
Wauseon and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Wauseon

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

HgtanA—Houghton muck, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 30n5d
Elevation: 650 to 1,070 feet
Mean annual precipitation: 35 to 41 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Houghton, undrained, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton, Undrained

Setting

Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 79 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very high (about 24.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Minor Components

Palms, undrained

Percent of map unit: 8 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

Muskego, undrained

Percent of map unit: 7 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB002IN - Limnic Muck

Hydric soil rating: Yes

IaA—Ionia loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4j
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ionia and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ionia

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

IaB—Ionia loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b4k
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ionia and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ionia

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

KaC—Kendallville loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b4l
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

KaC2—Kendallville loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b4m
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

KbC—Kendallville sandy loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b4n
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

KcC2—Kendallville soils, 7 to 15 percent slopes, moderately or severely eroded

Map Unit Setting

National map unit symbol: 6b4p
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: clay loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge

Hydric soil rating: No

KdA—Kerston muck and loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4q
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Kerston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kerston

Setting

Landform: Depressions on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over alternating layers of alluvium and/or organic material

Typical profile

Oa1 - 0 to 8 inches: muck
Oa2 - 8 to 15 inches: muck
H3 - 15 to 42 inches: stratified fine sand to silty clay loam
O'a - 42 to 50 inches: muck
H5 - 50 to 60 inches: stratified fine sand to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 14.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

KfA—Kokomo and Barry loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4t
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Kokomo and similar soils: 51 percent
Barry and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kokomo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 31 inches: silty clay loam
H3 - 31 to 60 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Barry

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

KgA—Kokomo, Barry, and Wallkill loams, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4v
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kokomo and similar soils: 40 percent
Barry and similar soils: 30 percent
Wallkill and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kokomo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 31 inches: silty clay loam
H3 - 31 to 60 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Barry

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None

Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Wallkill

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over organic material

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: fine sandy loam
Oa - 20 to 60 inches: muck

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 19.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

LaA—Lake borders

Map Unit Composition

Lake borders: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lake Borders

Setting

Landform: Beaches

LcA—Linwood muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4y
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 32 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Linwood and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Linwood

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Woody organic material over loamy till

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 31 inches: muck
H3 - 31 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 17.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

MaA—Macomb fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b50
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Macomb and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Macomb

Setting

Landform: Drainageways on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 32 inches: sandy clay loam
H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

MbA—Macomb sandy clay loam and Hoytville clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b51
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Macomb and similar soils: 51 percent
Hoytville and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Macomb

Setting

Landform: Drainageways on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 32 inches: sandy clay loam
H3 - 32 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

McA—Maumee loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b52
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Maumee and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Maumee

Setting

Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy glaciofluvial deposits and/or sandy glaciolacustrine deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 60 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

MhA—Morley loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b5j
Elevation: 580 to 1,400 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Morley and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhB—Glynwood loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2v4bq
Elevation: 700 to 1,060 feet

Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 31 inches: clay
BC - 31 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 28 to 45 inches to densic material
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Rawson

Percent of map unit: 6 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge

Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhB2—Glynwood loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2v4br
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 7 inches: loam
Bt - 7 to 26 inches: clay
BC - 26 to 30 inches: clay loam

Cd - 30 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 25 to 37 inches to densic material
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Rawson

Percent of map unit: 6 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhC—Morley loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2wp25
Elevation: 570 to 1,120 feet
Mean annual precipitation: 32 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till

Typical profile

Ap - 0 to 9 inches: loam
Bt1 - 9 to 18 inches: clay
Bt2 - 18 to 29 inches: clay
BC - 29 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 26 to 40 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C

Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood
Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount
Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo
Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhC2—Morley loam, 6 to 12 percent slopes, eroded

Map Unit Setting
National map unit symbol: 2wp26
Elevation: 750 to 1,220 feet
Mean annual precipitation: 32 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 165 days
Farmland classification: Farmland of local importance

Map Unit Composition
Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 17 inches: clay
Bt2 - 17 to 28 inches: clay
BC - 28 to 33 inches: clay loam
Cd - 33 to 79 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 24 to 38 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood

Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear

Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhD—Morley loam, 12 to 25 percent slopes

Map Unit Setting

National map unit symbol: 6b5p
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MhD2—Morley loam, 12 to 25 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b5q
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Moderately Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MhE—Morley loam, 25+ percent slopes

Map Unit Setting

National map unit symbol: 6b5r
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MkC3—Morley soils, 7 to 15 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 6b5t
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley, severely eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Severely Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MkD3—Morley clay loam, 12 to 18 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 2wvhl
Elevation: 720 to 1,120 feet
Mean annual precipitation: 35 to 40 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 160 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley, severely eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Severely Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 7 inches: clay loam
Bt - 7 to 25 inches: clay
BC - 25 to 33 inches: clay loam
Cd - 33 to 79 inches: clay loam

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: 26 to 45 inches to densic material
Drainage class: Moderately well drained
Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hennepin, severely eroded

Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Glynwood, severely eroded

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

MkE2—Morley soils, 25+ percent slopes, moderately or severely eroded

Map Unit Setting

National map unit symbol: 6b5w
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Moderately Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MmA—Metamora sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 68ts
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Metamora and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Metamora

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 21 inches: sandy loam
H3 - 21 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Blount
Percent of map unit: 4 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Selfridge
Percent of map unit: 4 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Corunna
Percent of map unit: 4 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Pewamo
Percent of map unit: 3 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

NaA—Nappanee silt loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b5x
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Nappanee and similar soils: 95 percent

Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

NaB—Nappanee silt loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b5y
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

NaB2—Nappanee silt loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b5z
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee, Moderately Eroded

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

NbA—Nappanee loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 68vb
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 24 inches: clay
H3 - 24 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Metamora

Percent of map unit: 5 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

NbB—Nappanee loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b60
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on ground moraines

Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

NbB2—Nappanee loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b61
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee, Moderately Eroded

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

OaA—Ogden muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b62
Elevation: 600 to 1,500 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Ogden and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ogden

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

Oa - 0 to 30 inches: muck
H2 - 30 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Very high (about 16.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

ObB2—Oshtemo loamy sand, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b65
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Oshtemo, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oshtemo, Moderately Eroded

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy and/or sandy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: loamy sand
H2 - 14 to 45 inches: sandy loam
H3 - 45 to 60 inches: stratified gravelly sand to sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

ObC—Oshtemo loamy sand, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b66
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Oshtemo and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oshtemo

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Stratified loamy and/or sandy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: loamy sand
H2 - 14 to 45 inches: sandy loam
H3 - 45 to 60 inches: stratified gravelly sand to sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

PaA—Palms muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b68
Elevation: 250 to 1,500 feet
Mean annual precipitation: 30 to 45 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Palms and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Palms

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material and/or loamy till

Typical profile

Oa1 - 0 to 13 inches: muck
Oa2 - 13 to 32 inches: muck
H3 - 32 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Very high (about 17.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

PbA—Pewamo clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t6lz
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 205 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on till plains, drainageways on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 11 inches: clay loam
Btg1 - 11 to 34 inches: clay
Btg2 - 34 to 47 inches: clay loam
BCg - 47 to 57 inches: clay loam
Cg - 57 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression

Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 8 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Brookston

Percent of map unit: 4 percent
Landform: Drainageways on till plains, depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Palms, undrained

Percent of map unit: 3 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

PcA—Pewamo mucky clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6b
Elevation: 600 to 1,400 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Pewamo and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: mucky silty clay loam
H2 - 7 to 32 inches: clay loam
H3 - 32 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

PdA—Plainfield and Berrien loamy sands, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6c
Elevation: 600 to 1,150 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 51 percent
Berrien and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

PdB—Plainfield and Berrien loamy sands, 3 to 7 percent slopes

Map Unit Setting
National map unit symbol: 6b6d
Elevation: 600 to 1,150 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Plainfield and similar soils: 51 percent
Berrien and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting
Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile
H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities
Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

PeB—Plainfield and Ottawa loamy sands, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b6g
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days

Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PeB2—Plainfield and Ottawa loamy sands, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6h
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield, moderately eroded, and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield, Moderately Eroded

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PeC—Plainfield and Ottawa loamy sands, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b6j
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Beach ridges

Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PeC2—Plainfield and Ottawa loamy sands, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6k
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield, Moderately Eroded

Setting

Landform: Beach ridges

Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PwmaaA—Pewamo clay loam, dense substratum, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2qz3f
Elevation: 670 to 830 feet
Mean annual precipitation: 31 to 36 inches
Mean annual air temperature: 47 to 49 degrees F
Frost-free period: 143 to 182 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo, dense substratum, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo, Dense Substratum

Setting

Landform: Drainageways on nearshore zones (relict), flats on nearshore zones (relict)

Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over dense till

Typical profile

Ap - 0 to 11 inches: clay loam
Btg - 11 to 39 inches: clay loam
BCg - 39 to 56 inches: clay loam
2Cd - 56 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 30 to 70 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Metamora, dense substratum

Percent of map unit: 12 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Blount

Percent of map unit: 4 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Gilford, loamy substratum

Percent of map unit: 2 percent
Landform: Drainageways on nearshore zones (relict), depressions on nearshore zones (relict)
Landform position (three-dimensional): Dip
Down-slope shape: Linear

Across-slope shape: Concave
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Selfridge, dense substratum
Percent of map unit: 2 percent
Landform: Knolls on nearshore zones (relict)
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

RaA—Rifle peat, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b6l
Elevation: 810 to 850 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 130 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition
Rifle and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rifle

Setting
Landform: Depressions on till plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Woody organic material

Typical profile
Oa - 0 to 14 inches: muck
Oe - 14 to 60 inches: mucky peat

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A/D
Ecological site: F098XA006MI - Mucky Depressions
Hydric soil rating: Yes

SdC—St. Clair loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b6w
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

St. clair and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

SdC2—St. Clair loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6x
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

St. clair, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair, Moderately Eroded

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

SdD2—St. Clair loam, 12 to 25 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6y
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

St. clair, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair, Moderately Eroded

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

SeC3—St. Clair soils, 7 to 15 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 6b71
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

St. clair, severely eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair, Severely Eroded

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: clay loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge

Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

Sf—Sebewa loam, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2v4bw
Elevation: 570 to 1,070 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 110 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Sebewa and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sebewa

Setting

Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy drift over sandy and gravelly outwash

Typical profile

Ap - 0 to 11 inches: loam
Btg1 - 11 to 21 inches: clay loam
Btg2 - 21 to 33 inches: clay loam
2Cg - 33 to 79 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 23 to 39 inches to strongly contrasting textural stratification
Drainage class: Poorly drained
Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 45 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 3.0
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Minor Components

Matherton
Percent of map unit: 6 percent
Landform: Drainageways, drainageways on stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Gilford
Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

Sg—Sewage lagoons

Map Unit Composition
Sewage lagoons: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

W—Water

Map Unit Composition
Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

WaA—Wallkill loam, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b73
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Wallkill and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wallkill

Setting

Landform: Depressions on flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over organic material

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: fine sandy loam
Oa - 20 to 60 inches: muck

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 19.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

WawabB—Wawasee loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2wp1x
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 9 inches: loam
Bt1 - 9 to 24 inches: loam
Bt2 - 24 to 33 inches: clay loam
C - 33 to 79 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawabC—Wawasee loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2wvgl
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 24 inches: loam

Bt2 - 24 to 33 inches: clay loam
C - 33 to 79 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawacB—Wawasee loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvgk
Elevation: 670 to 1,180 feet

Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 24 inches: loam
Bt2 - 24 to 32 inches: clay loam
C - 32 to 79 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains

Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawacC—Wawasee loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvgm
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 7 inches: loam
Bt1 - 7 to 23 inches: loam
Bt2 - 23 to 31 inches: clay loam
C - 31 to 79 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawadD—Wawasee loam, 12 to 25 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvgr
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Wawasee and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 7 inches: loam
Bt1 - 7 to 23 inches: loam
Bt2 - 23 to 31 inches: clay loam
C - 31 to 79 inches: loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F098XA022MI - Loamy Slopes
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 6 percent
Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 4 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave

Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WcA—Wauseon loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b75
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Wauseon and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wauseon

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

WdA—Willette muck, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b76
Elevation: 600 to 1,500 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Willette and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Willette

Setting

Landform: Depressions, depressions
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Organic material over loamy till and/or lacustrine deposits

Typical profile

Oa - 0 to 30 inches: muck
H2 - 30 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Very high (about 16.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

ZfsacA—Ziegenfuss clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2qz3g
Elevation: 570 to 790 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Ziegenfuss and similar soils: 86 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ziegenfuss

Setting

Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over loamy till

Typical profile

Ap - 0 to 9 inches: clay loam
Bg - 9 to 30 inches: clay loam
BC - 30 to 40 inches: clay loam
C - 40 to 67 inches: clay loam
2Cd - 67 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 60 to 80 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 28 percent
Maximum salinity: Nonsaline (0.1 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 9 percent
Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Houcktown

Percent of map unit: 5 percent
Landform: Wave-worked till plains
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Monroe County, Michigan

23A—Metamora sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 68ts
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Metamora and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Metamora

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 21 inches: sandy loam
H3 - 21 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Selfridge

Percent of map unit: 4 percent
Landform: Knolls on till plains

Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Corunna

Percent of map unit: 4 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Blount

Percent of map unit: 4 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Pewamo

Percent of map unit: 3 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

43A—Nappanee loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 68vb
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 24 inches: clay
H3 - 24 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Metamora

Percent of map unit: 5 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

100A—Hoytville and Wauseon loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4h
Elevation: 700 to 1,200 feet

Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 51 percent
Wauseon and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Wauseon

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

112A—Wauseon loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b75
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Wauseon and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wauseon

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

ZfsacA—Ziegenfuss clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2qz3g
Elevation: 570 to 790 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Ziegenfuss and similar soils: 86 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ziegenfuss

Setting

Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over loamy till

Typical profile

Ap - 0 to 9 inches: clay loam
Bg - 9 to 30 inches: clay loam
BC - 30 to 40 inches: clay loam
C - 40 to 67 inches: clay loam
2Cd - 67 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 60 to 80 inches to densic material

Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 28 percent
Maximum salinity: Nonsaline (0.1 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 9 percent
Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Houcktown

Percent of map unit: 5 percent
Landform: Wave-worked till plains
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

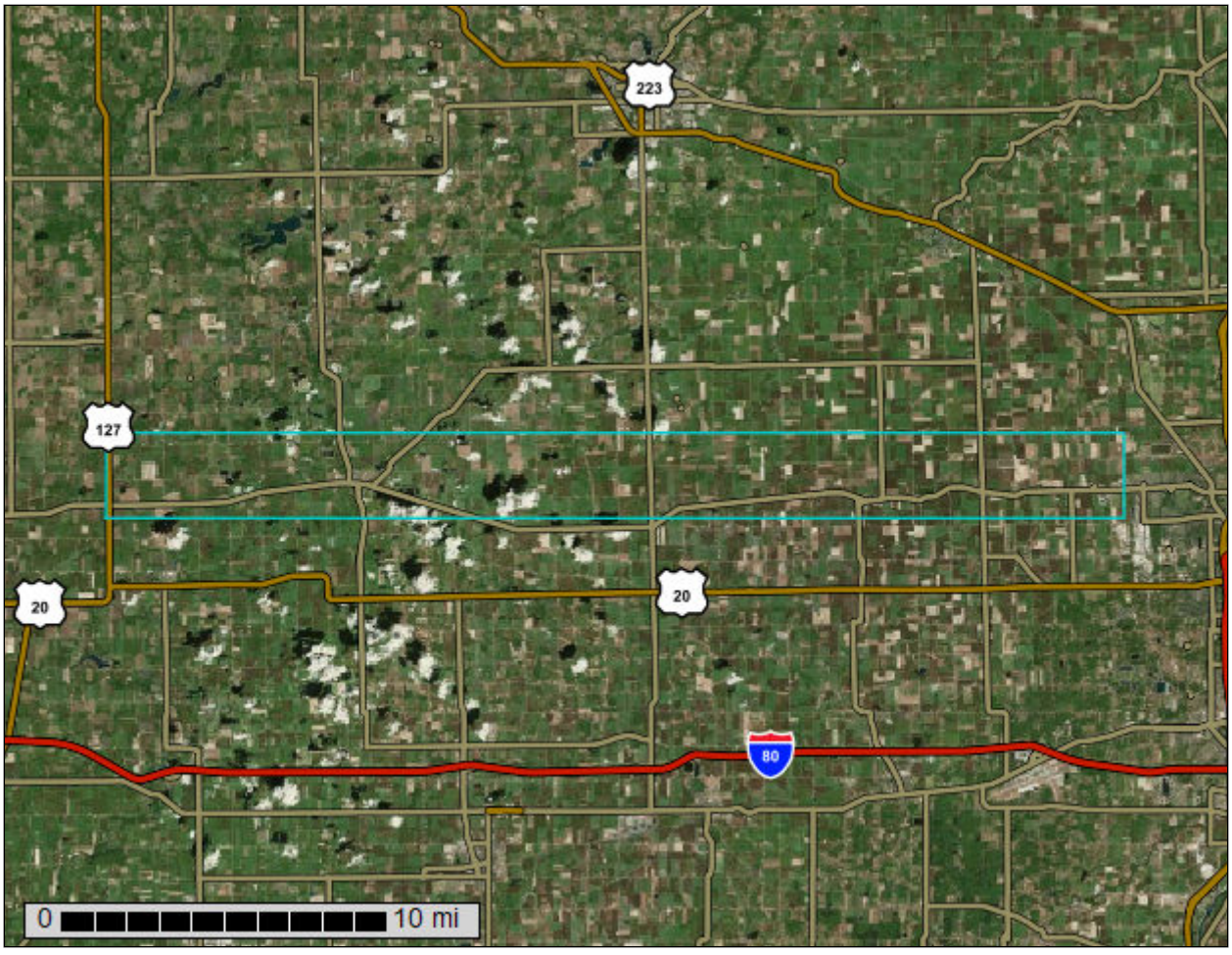
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Fulton County, Ohio, Hillsdale County, Michigan, Lenawee County, Michigan, Lucas County, Ohio, and Monroe County, Michigan



June 13, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

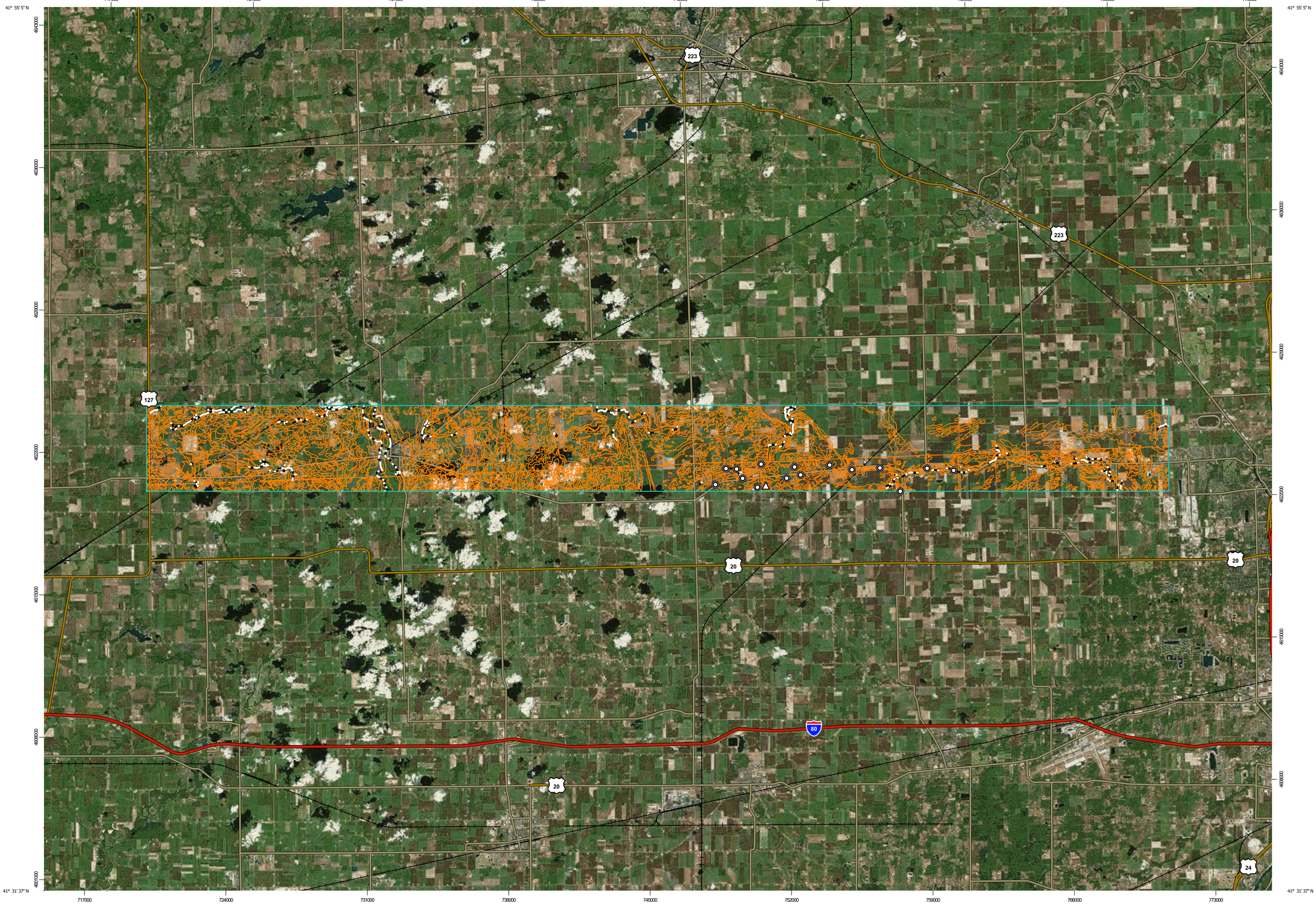
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:122,000 if printed on C landscape (22" x 17") sheet.

N

Meters
0 1500 3000 6000 9000

Feet
0 5000 10000 20000 30000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:15,800 to 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Fulton County, Ohio
Survey Area Data: Version 23, Aug 30, 2024

Soil Survey Area: Hillsdale County, Michigan
Survey Area Data: Version 22, Aug 27, 2024

Soil Survey Area: Lenawee County, Michigan
Survey Area Data: Version 20, Aug 27, 2024

Soil Survey Area: Lucas County, Ohio
Survey Area Data: Version 24, Aug 28, 2024

Soil Survey Area: Monroe County, Michigan
Survey Area Data: Version 22, Aug 27, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 9, 2019—Jun 18, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BcA	Bixler loamy fine sand, 0 to 3 percent slopes	5.0	0.0%
Blo2A1	Blount loam, 0 to 2 percent slopes	206.0	0.4%
Blo2B1	Blount loam, 2 to 6 percent slopes	962.7	1.8%
BnA	Blount loam, Erie-Huron Lake Plain, 0 to 2 percent slopes	932.2	1.8%
BoB	Blount-Rimer complex, 2 to 6 percent slopes	103.3	0.2%
BrB	Boyer loamy sand, 1 to 6 percent slopes	18.5	0.0%
ByA	Brady sandy loam, 0 to 3 percent slopes	190.3	0.4%
Cn	Colwood loam	7.9	0.0%
CoB	Colonie fine sand, 1 to 6 percent slopes	45.7	0.1%
CoC	Colonie fine sand, 6 to 12 percent slopes	0.9	0.0%
DmA	Digby loam, 0 to 3 percent slopes	40.4	0.1%
DtA	Dixboro fine sandy loam, 0 to 3 percent slopes	26.0	0.0%
FtA	Fulton silty clay loam, 0 to 2 percent slopes	29.0	0.1%
Gf	Gilford fine sandy loam	89.0	0.2%
GnB2	Glynwood loam, 2 to 6 percent slopes, eroded	348.2	0.7%
GnC2	Glynwood loam, 6 to 12 percent slopes, eroded	35.2	0.1%
GnD2	Glynwood loam, 12 to 18 percent slopes, eroded	13.1	0.0%
GoC3	Glynwood clay loam, 6 to 12 percent slopes, severely eroded	73.5	0.1%
HkA	Haskins loam, 0 to 3 percent slopes	844.5	1.6%
HoA	Hoytville clay loam, 0 to 1 percent slopes	1,757.5	3.3%
KfA	Kibbie loam, 0 to 3 percent slopes	15.8	0.0%
Mf	Mermill loam	698.0	1.3%
Mo	Millgrove loam	132.6	0.3%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
NnA	Nappanee loam, 0 to 2 percent slopes	387.3	0.7%
NnB	Nappanee loam, 2 to 6 percent slopes	74.8	0.1%
OrB	Oshtemo loamy sand, 0 to 6 percent slopes	154.1	0.3%
OtB	Ottokee fine sand, 0 to 6 percent slopes	71.2	0.1%
OuB	Ottokee-Glynwood complex, 3 to 8 percent slopes	23.2	0.0%
PeB	Perrin sandy loam, 2 to 6 percent slopes	29.6	0.1%
Pm	Pewamo clay loam	920.4	1.7%
RbB	Rawson sandy loam, 2 to 6 percent slopes	127.5	0.2%
RnA	Rimer loamy fine sand, 0 to 3 percent slopes	20.0	0.0%
SdB	Seward loamy fine sand, 2 to 6 percent slopes	48.7	0.1%
SfB2	Shinrock silty clay loam, 2 to 6 percent slopes, eroded	4.6	0.0%
Sh	Shoals silt loam, frequently flooded	98.4	0.2%
So	Sloan silty clay loam, frequently flooded	315.0	0.6%
TdA	Tedrow loamy fine sand, 0 to 3 percent slopes	77.3	0.1%
TuB	Tuscola fine sandy loam, 3 to 8 percent slopes	7.4	0.0%
W	Water	15.3	0.0%
Wf	Wauseon fine sandy loam	10.0	0.0%
Zie5A	Ziegenfuss clay loam, 0 to 1 percent slopes	1,237.1	2.3%
Subtotals for Soil Survey Area		**10,197.2**	**19.4%**
Totals for Area of Interest		**52,689.4**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
10C2	Hillsdale-Riddles sandy loams, 6 to 12 percent slopes	1.5	0.0%
12B	Williamstown-Conover complex, 1 to 6 percent slopes	3.2	0.0%
18B	Glynwood-Blount complex, 1 to 6 percent slopes	19.1	0.0%
18C2	Morley loam, 6 to 12 percent slopes, eroded	0.9	0.0%
19B	Blount loam, 0 to 4 percent slopes	76.4	0.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
20	Pewamo silt loam	28.5	0.1%
Subtotals for Soil Survey Area		**129.6**	**0.2%**
Totals for Area of Interest		**52,689.4**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BbB	Berrien loamy sand, 3 to 7 percent slopes	5.1	0.0%
BbB2	Berrien loamy sand, 3 to 7 percent slopes, moderately eroded	10.8	0.0%
BcA	Berrien sandy loam, 0 to 3 percent slopes	155.7	0.3%
BcB	Berrien sandy loam, 3 to 7 percent slopes	237.7	0.5%
BcB2	Berrien sandy loam, 3 to 7 percent slopes, moderately eroded	24.8	0.0%
BdA	Berville loam, 0 to 3 percent slopes	44.0	0.1%
BeA	Berville sandy loam, 0 to 3 percent slopes	32.3	0.1%
BgA	Blount loam and Pewamo clay loam, 0 to 3 percent slopes	2,792.0	5.3%
BhA	Brady sandy loam, 0 to 3 percent slopes	258.2	0.5%
BkA	Brady and Macomb loams, 0 to 3 percent slopes	820.4	1.6%
BlA	Blount loam, Erie-Huron Lake Plain, 0 to 2 percent slopes	443.8	0.8%
BmA	Brady and Macomb sandy loams, 0 to 3 percent slopes	4.0	0.0%
BnA	Bronson sandy loam, 0 to 3 percent slopes	592.1	1.1%
BnB	Bronson sandy loam, 3 to 7 percent slopes	184.3	0.3%
BntaaA	Blount loam, 0 to 2 percent slopes	2,118.1	4.0%
BntaaB	Blount loam, 2 to 6 percent slopes	1,937.3	3.7%
BntabB	Blount loam, 2 to 6 percent slopes, eroded	11.6	0.0%
BoA	Brookston loam, 0 to 3 percent slopes	65.2	0.1%
BpA	Brookston loam, overwashed, 0 to 3 percent slopes	57.9	0.1%
BsB	Boyer loamy sand, 1 to 6 percent slopes	1.0	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CaB	Cadmus loam, 3 to 7 percent slopes	113.7	0.2%
CaB2	Cadmus loam, 3 to 7 percent slopes, moderately eroded	20.3	0.0%
CaracA	Carlisle muck, disintegration moraine, 0 to 2 percent slopes	18.4	0.0%
CbA	Cadmus sandy loam, 0 to 3 percent slopes	38.0	0.1%
CbB	Cadmus sandy loam, 3 to 7 percent slopes	93.4	0.2%
CbB2	Cadmus sandy loam, 3 to 7 percent slopes, moderately eroded	36.4	0.1%
CcA	Cadmus and Blount loams, 0 to 3 percent slopes	53.2	0.1%
CfA	Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes	122.8	0.2%
CgA	Conover loam, 0 to 3 percent slopes	132.4	0.3%
CgB	Conover loam, 3 to 7 percent slopes	44.1	0.1%
CnB	Colonie fine sand, 1 to 6 percent slopes	91.3	0.2%
Cr	Corunna sandy loam	11.0	0.0%
DmA	Digby loam, 0 to 3 percent slopes	30.2	0.1%
DtA	Dixboro fine sandy loam, 0 to 3 percent slopes	17.5	0.0%
FcA	Fox sandy loam, till plain, 0 to 2 percent slopes	54.5	0.1%
FcB	Fox sandy loam, till plain, 2 to 6 percent slopes	42.5	0.1%
FdC3	Fox soils, 7 to 15 percent slopes, severely eroded	2.4	0.0%
GaA	Genesee loam, 0 to 2 percent slopes, occasionally flooded	21.9	0.0%
GcA	Genesee and Eel loams, 0 to 3 percent slopes	187.9	0.4%
GeA	Granby sandy loam, 0 to 3 percent slopes	117.6	0.2%
GfA	Griffin and Genesee loams, 0 to 3 percent slopes	433.8	0.8%
GgA	Griffin and Sloan loams, 0 to 3 percent slopes	10.6	0.0%
GhA	Griffin and Sloan sandy loams, 0 to 3 percent slopes	599.3	1.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
GoC3	Glynwood clay loam, 6 to 12 percent slopes, severely eroded	0.6	0.0%
Gp	Gravel pits	20.0	0.0%
HaC2	Hillsdale sandy loam, 7 to 15 percent slopes, moderately eroded	10.5	0.0%
HeA	Hoytville clay loam and Rimer sandy loam, 0 to 3 percent slopes	331.6	0.6%
HfA	Hoytville and Wauseon loams, 0 to 3 percent slopes	1,156.3	2.2%
HgtanA	Houghton muck, disintegration moraine, 0 to 2 percent slopes	57.9	0.1%
HoA	Hoytville clay loam, 0 to 1 percent slopes	312.6	0.6%
HsA	Haskins loam, 0 to 3 percent slopes	35.9	0.1%
IaA	Ionia loam, 0 to 3 percent slopes	54.4	0.1%
IaB	Ionia loam, 3 to 7 percent slopes	45.3	0.1%
KaC2	Kendallville loam, 7 to 15 percent slopes, moderately eroded	22.7	0.0%
KcC2	Kendallville soils, 7 to 15 percent slopes, moderately or severely eroded	2.0	0.0%
KdA	Kerston muck and loams, 0 to 3 percent slopes	29.5	0.1%
KfA	Kokomo and Barry loams, 0 to 3 percent slopes	47.3	0.1%
KgA	Kokomo, Barry, and Wallkill loams, overwashed, 0 to 3 percent slopes	18.2	0.0%
MaA	Macomb fine sandy loam, 0 to 3 percent slopes	53.4	0.1%
MbA	Macomb sandy clay loam and Hoytville clay loam, 0 to 3 percent slopes	217.7	0.4%
McA	Maumee loamy sand, 0 to 3 percent slopes	20.7	0.0%
MhA	Morley loam, 0 to 3 percent slopes	344.5	0.7%
MhB	Glynwood loam, 2 to 6 percent slopes	673.2	1.3%
MhB2	Glynwood loam, 2 to 6 percent slopes, eroded	2,210.6	4.2%
MhC	Morley loam, 6 to 12 percent slopes	0.7	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MhC2	Morley loam, 6 to 12 percent slopes, eroded	163.2	0.3%
MhD2	Morley loam, 12 to 25 percent slopes, moderately eroded	7.3	0.0%
MkC3	Morley soils, 7 to 15 percent slopes, severely eroded	45.9	0.1%
MkD3	Morley clay loam, 12 to 18 percent slopes, severely eroded	8.3	0.0%
MmA	Metamora sandy loam, 0 to 3 percent slopes	70.7	0.1%
Mo	Millgrove loam	45.2	0.1%
Mr	Mermill loam	327.9	0.6%
NaA	Nappanee silt loam, 0 to 3 percent slopes	1,800.1	3.4%
NaB	Nappanee silt loam, 3 to 7 percent slopes	12.1	0.0%
NbA	Nappanee loam, 0 to 3 percent slopes	37.0	0.1%
NbB	Nappanee loam, 3 to 7 percent slopes	197.3	0.4%
NbB2	Nappanee loam, 3 to 7 percent slopes, moderately eroded	341.5	0.6%
NnA	Nappanee loam, 0 to 2 percent slopes	62.6	0.1%
NnB	Nappanee loam, 2 to 6 percent slopes	8.5	0.0%
OrB	Oshtemo loamy sand, 0 to 6 percent slopes	29.2	0.1%
PbA	Pewamo clay loam, 0 to 2 percent slopes	2,897.6	5.5%
PcA	Pewamo mucky clay loam, 0 to 3 percent slopes	102.7	0.2%
PdA	Plainfield and Berrien loamy sands, 0 to 3 percent slopes	84.0	0.2%
PdB	Plainfield and Berrien loamy sands, 3 to 7 percent slopes	160.1	0.3%
PeB2	Plainfield and Ottawa loamy sands, 3 to 7 percent slopes, moderately eroded	66.9	0.1%
PeC2	Plainfield and Ottawa loamy sands, 7 to 15 percent slopes, moderately eroded	26.9	0.1%
PrB	Perrin sandy loam, 2 to 6 percent slopes	21.6	0.0%
RnA	Rimer loamy fine sand, 0 to 3 percent slopes	19.0	0.0%
RsB	Rawson sandy loam, 2 to 6 percent slopes	4.2	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
SdC	St. Clair loam, 7 to 15 percent slopes	39.2	0.1%
SdC2	St. Clair loam, 7 to 15 percent slopes, moderately eroded	104.2	0.2%
SdD2	St. Clair loam, 12 to 25 percent slopes, moderately eroded	4.9	0.0%
SeC3	St. Clair soils, 7 to 15 percent slopes, severely eroded	22.0	0.0%
Sg	Sewage lagoons	41.5	0.1%
Sm	Shoals silt loam, frequently flooded	102.6	0.2%
So	Sloan silty clay loam, frequently flooded	135.4	0.3%
W	Water	8.4	0.0%
WaA	Wallkill loam, overwashed, 0 to 3 percent slopes	1.9	0.0%
WawabB	Wawasee loam, 2 to 6 percent slopes	0.4	0.0%
WawabC	Wawasee loam, 6 to 12 percent slopes	25.3	0.0%
WawacC	Wawasee loam, 6 to 12 percent slopes, eroded	1.5	0.0%
WcA	Wauseon loam, 0 to 3 percent slopes	549.1	1.0%
Ws	Wauseon fine sandy loam	27.7	0.1%
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	11,138.5	21.1%
Subtotals for Soil Survey Area		**36,497.7**	**69.3%**
Totals for Area of Interest		**52,689.4**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
DgA	Digby sandy loam, 0 to 2 percent slopes	8.4	0.0%
Ee	Eel loam, occasionally flooded	37.7	0.1%
HnA	Haskins loam, 0 to 3 percent slopes	350.1	0.7%
HoA	Hoytville clay loam, 0 to 1 percent slopes	1,534.1	2.9%
Mf	Mermill loam	612.2	1.2%
MmA	Metamora sandy loam, 0 to 3 percent slopes	309.0	0.6%
NnA	Nappanee loam, 0 to 3 percent slopes	833.0	1.6%
RnA	Rimer loamy fine sand, 0 to 3 percent slopes	36.1	0.1%
SdB	Seward loamy fine sand, 2 to 6 percent slopes	18.2	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Sh	Shoals loam, occasionally flooded	76.7	0.1%
So	Sloan loam, occasionally flooded	147.2	0.3%
StC2	St. Clair loam, 7 to 15 percent slopes, moderately eroded	0.6	0.0%
SuC2	St. Clair silty clay loam, 4 to 12 percent slopes, eroded	51.5	0.1%
SuE3	St. Clair silty clay loam, 12 to 25 percent slopes, severely eroded	2.6	0.0%
Uo	Udorthents, loamy	6.9	0.0%
W	Water	2.7	0.0%
Zie5A	Ziegenfuss clay loam, 0 to 1 percent slopes	1,137.6	2.2%
Subtotals for Soil Survey Area		**5,164.4**	**9.8%**
Totals for Area of Interest		**52,689.4**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
13A	Blount loam, Erie-Huron Lake Plain, 0 to 2 percent slopes	20.1	0.0%
24	Corunna sandy loam	41.9	0.1%
43A	Nappanee loam, 0 to 3 percent slopes	8.1	0.0%
44A	Wasepi sandy loam, loamy substratum, 0 to 3 percent slopes	21.9	0.0%
100A	Hoytville and Wauseon loams, 0 to 3 percent slopes	36.7	0.1%
118A	Rimer loamy fine sand, 0 to 3 percent slopes	0.7	0.0%
ZfsacA	Ziegenfuss clay loam, 0 to 1 percent slopes	208.0	0.4%
Subtotals for Soil Survey Area		**337.4**	**0.6%**
Totals for Area of Interest		**52,689.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the

landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present

or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Fulton County, Ohio

BcA—Bixler loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 5nxt
Elevation: 650 to 720 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 166 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Bixler and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bixler

Setting

Landform: Ridges on outwash plains, ridges on beach ridges, ridges on deltas, knolls on outwash plains, knolls on beach ridges, knolls on deltas
Landform position (two-dimensional): Summit, shoulder
Parent material: Sandy lacustrine deposits over stratified lacustrine deposits

Typical profile

H1 - 0 to 10 inches: loamy fine sand
H2 - 10 to 22 inches: loamy fine sand
H3 - 22 to 25 inches: fine sandy loam
H4 - 25 to 60 inches: stratified fine sand to silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Ottokee

Percent of map unit: 4 percent
Landform: Dunes on lake plains, beach ridges on lake plains

Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Linear

Tedrow

Percent of map unit: 4 percent
Landform: Dunes on outwash plains, dunes on lake plains, beach ridges on outwash plains, beach ridges on lake plains
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Convex
Across-slope shape: Convex

Colwood

Percent of map unit: 4 percent
Landform: Depressions on deltas, drainageways on deltas, depressions on beach ridges, drainageways on beach ridges, depressions on outwash plains, drainageways on outwash plains
Hydric soil rating: Yes

Lamson

Percent of map unit: 3 percent
Landform: Depressions on beach ridges, drainageways on deltas, depressions on deltas, drainageways on outwash plains, depressions on outwash plains, drainageways on beach ridges
Hydric soil rating: Yes

Blo2A1—Blount loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wp2k
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: End moraines, ground moraines
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave, linear
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 30 inches: silty clay
BC - 30 to 37 inches: clay loam
Cd - 37 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 28 to 48 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 6 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Conover

Percent of map unit: 4 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Glynwood

Percent of map unit: 3 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex

Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Badaxe

Percent of map unit: 2 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Blo2B1—Blount loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2wp2l
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 28 inches: silty clay
BC - 28 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 26 to 45 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Glynwood, eroded

Percent of map unit: 8 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Conover

Percent of map unit: 6 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Depressions on end moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Badaxe

Percent of map unit: 2 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, convex
Across-slope shape: Linear
Hydric soil rating: No

BnA—Blount loam, Erie-Huron Lake Plain, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wb29
Elevation: 540 to 850 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Nearshore zones (relict), wave-worked till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Moderately fine-textured lodgment till

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 27 inches: clay
BC - 27 to 37 inches: clay loam
Cd - 37 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 19 to 49 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F099XY007MI - Lake Plain Flats

Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 7 percent
Landform: Nearshore zones (relict), wave-worked till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Microfeatures of landform position: Open depressions
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Metamora

Percent of map unit: 5 percent
Landform: Nearshore zones (relict), wave-worked till plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex, linear
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Selfridge

Percent of map unit: 3 percent
Landform: Wave-worked till plains, nearshore zones (relict)
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Microfeatures of landform position: Rises
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

BoB—Blount-Rimer complex, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 5nxx
Elevation: 580 to 1,530 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 55 percent
Rimer and similar soils: 30 percent

Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Rises on ground moraines, flats on end moraines, flats on ground moraines, rises on end moraines
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 15 inches: clay loam
H3 - 15 to 25 inches: clay loam
H4 - 25 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Rimer

Setting

Landform: Till plains, lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy glaciolacustrine deposits over till

Typical profile

H1 - 0 to 9 inches: loamy fine sand
H2 - 9 to 23 inches: fine sand
H3 - 23 to 29 inches: fine sandy loam
H4 - 29 to 60 inches: silty clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Kibbie

Percent of map unit: 4 percent
Landform: Deltas, outwash plains, ground moraines, lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear

Fulton

Percent of map unit: 4 percent
Landform: Lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex

Seward

Percent of map unit: 4 percent
Landform: Beach ridges on till plains, beach ridges on lake plains, dunes on till plains, dunes on lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Linear

Tedrow

Percent of map unit: 3 percent
Landform: Dunes on outwash plains, dunes on lake plains, beach ridges on outwash plains, beach ridges on lake plains
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Convex
Across-slope shape: Convex

BrB—Boyer loamy sand, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 5nxy
Elevation: 600 to 970 feet
Mean annual precipitation: 27 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Boyer and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boyer

Setting

Landform: Stream terraces, moraines, outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till over gravelly outwash

Typical profile

H1 - 0 to 17 inches: loamy sand
H2 - 17 to 30 inches: coarse sandy loam
H3 - 30 to 60 inches: gravelly sand

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Minor Components

Spinks

Percent of map unit: 8 percent
Landform: Lake plains, outwash plains, moraines, beach ridges, beach ridges, beach ridges, dunes, dunes, dunes
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Oshtemo

Percent of map unit: 7 percent
Landform: Terraces

ByA—Brady sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 5nxz
Elevation: 600 to 1,200 feet
Mean annual precipitation: 27 to 37 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Outwash terraces, outwash plains, beach ridges
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Outwash

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 34 inches: sandy loam
H3 - 34 to 60 inches: loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Tedrow

Percent of map unit: 4 percent
Landform: Dunes on outwash plains, dunes on lake plains, beach ridges on outwash plains, beach ridges on lake plains
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Convex
Across-slope shape: Convex

Gilford

Percent of map unit: 4 percent
Landform: Drainageways on beach ridges, depressions on beach ridges, drainageways on terraces, depressions on terraces, drainageways on outwash plains, depressions on outwash plains
Hydric soil rating: Yes

Millgrove

Percent of map unit: 4 percent
Landform: Depressions on outwash plains, drainageways on outwash plains, depressions on terraces, drainageways on terraces, depressions on beach ridges, drainageways on beach ridges
Hydric soil rating: Yes

Clayey textures below 35 inches

Percent of map unit: 3 percent

Cn—Colwood loam

Map Unit Setting

National map unit symbol: 5ny1
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Colwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colwood

Setting

Landform: Flats on outwash plains, depressions on deltas, flats on deltas, depressions on outwash plains
Parent material: Glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 42 inches: clay loam
H3 - 42 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 11.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Forage suitability group: Unnamed (G099XYC-1OH)
Other vegetative classification: Unnamed (G099XYC-1OH)
Hydric soil rating: Yes

Minor Components

Kibbie

Percent of map unit: 4 percent
Landform: Deltas, outwash plains, ground moraines, lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Dixboro

Percent of map unit: 4 percent
Landform: Outwash plains, lake plains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Rise, talf
Down-slope shape: Linear

Across-slope shape: Linear
Hydric soil rating: No

Lamson

Percent of map unit: 4 percent
Landform: Depressions on lake plains
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Lenawee

Percent of map unit: 3 percent
Landform: Flats on deltas, depressions on deltas, flats on outwash plains, depressions on outwash plains
Hydric soil rating: Yes

CoB—Colonie fine sand, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2ljyc
Elevation: 590 to 820 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 140 to 220 days
Farmland classification: Farmland of local importance

Map Unit Composition

Colonie and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colonie

Setting

Landform: Longshore bars (relict) on lake plains, dunes on lake plains, beach ridges on lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Beach sand and/or eolian deposits

Typical profile

Ap - 0 to 8 inches: fine sand
E - 8 to 21 inches: fine sand
E and Bt1 - 21 to 25 inches: fine sand
E and Bt2 - 25 to 68 inches: fine sand
C - 68 to 80 inches: fine sand

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 20.00 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Forage suitability group: Unnamed (G139XYB-1OH)
Other vegetative classification: Unnamed (G139XYB-1OH)
Hydric soil rating: No

Minor Components

Tedrow

Percent of map unit: 7 percent
Landform: Beach ridges on lake plains, longshore bars (relict) on lake plains, dunes on lake plains
Landform position (two-dimensional): Backslope, footslope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Granby

Percent of map unit: 1 percent
Landform: Drainageways on dunes on lake plains, depressions on longshore bars (relict) on lake plains, drainageways on beach ridges on lake plains, depressions on beach ridges on lake plains, depressions on dunes on lake plains, drainageways on longshore bars (relict) on lake plains
Landform position (two-dimensional): Backslope, footslope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F099XY011MI - Warm Wet Sandy Depression
Hydric soil rating: Yes

CoC—Colonie fine sand, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2ljyd
Elevation: 650 to 830 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 50 degrees F

Frost-free period: 140 to 220 days
Farmland classification: Farmland of local importance

Map Unit Composition

Colonie and similar soils: 96 percent
Minor components: 4 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colonie

Setting

Landform: Dunes on lake plains, beach ridges on lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Beach sand and/or eolian deposits

Typical profile

Ap - 0 to 7 inches: fine sand
E - 7 to 31 inches: fine sand
E and Bt1 - 31 to 35 inches: fine sand
E and Bt2 - 35 to 68 inches: fine sand
C - 68 to 80 inches: fine sand

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 20.00 in/hr)
Depth to water table: About 60 to 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Forage suitability group: Unnamed (G139XYB-1OH)
Other vegetative classification: Unnamed (G139XYB-1OH)
Hydric soil rating: No

Minor Components

Ottokee

Percent of map unit: 3 percent
Landform: Dunes on lake plains, beach ridges on lake plains
Landform position (two-dimensional): Backslope, footslope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Granby

Percent of map unit: 1 percent
Landform: Drainageways on dunes on lake plains, depressions on longshore bars (relict) on lake plains, drainageways on longshore bars (relict) on lake plains, depressions on beach ridges on lake plains, drainageways on beach ridges on lake plains, depressions on dunes on lake plains
Landform position (two-dimensional): Backslope, footslope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F099XY011MI - Warm Wet Sandy Depression
Hydric soil rating: Yes

DmA—Digby loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 5ny3
Elevation: 780 to 870 feet
Mean annual precipitation: 27 to 37 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 140 to 165 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Digby and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Digby

Setting

Landform: Outwash plains, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Outwash

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 32 inches: clay loam
H3 - 32 to 60 inches: stratified gravelly sand to gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY007MI - Lake Plain Flats
Forage suitability group: Unnamed (G099XYC-1OH)
Other vegetative classification: Unnamed (G099XYC-1OH)
Hydric soil rating: No

Minor Components

Haskins

Percent of map unit: 8 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Millgrove

Percent of map unit: 7 percent
Landform: Depressions on outwash plains, drainageways on outwash plains, depressions on terraces, drainageways on terraces, depressions on beach ridges, drainageways on beach ridges
Hydric soil rating: Yes

DtA—Dixboro fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 5ny4
Elevation: 600 to 1,000 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Dixboro and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dixboro

Setting

Landform: Outwash plains, lake plains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Rise, talf

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 39 inches: fine sandy loam
H3 - 39 to 60 inches: stratified very fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Bixler

Percent of map unit: 5 percent
Landform: Beach ridges on outwash plains, beach ridges on lake plains, rises on outwash plains, rises on lake plains
Down-slope shape: Convex
Across-slope shape: Linear

Lamson

Percent of map unit: 5 percent
Landform: Depressions on deltas, drainageways on deltas, depressions on outwash plains, drainageways on outwash plains
Hydric soil rating: Yes

Colwood

Percent of map unit: 5 percent
Landform: Drainageways on outwash plains, depressions on outwash plains, drainageways on deltas, depressions on deltas
Hydric soil rating: Yes

FtA—Fulton silty clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 5ny6
Elevation: 500 to 1,000 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Fulton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fulton

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Glaciolacustrine deposits

Typical profile

H1 - 0 to 9 inches: silty clay loam
H2 - 9 to 28 inches: silty clay
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Latty

Percent of map unit: 5 percent
Landform: Drainageways on lake plains, depressions on lake plains
Hydric soil rating: Yes

Haskins

Percent of map unit: 5 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

More sloping areas

Percent of map unit: 5 percent

Gf—Gilford fine sandy loam

Map Unit Setting

National map unit symbol: 5ny9
Elevation: 360 to 900 feet
Mean annual precipitation: 27 to 45 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 130 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Gilford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gilford

Setting

Landform: Flats on beach ridges, flats on deltas, flats on outwash plains
Parent material: Outwash

Typical profile

H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 31 inches: sandy loam
H3 - 31 to 60 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)

Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Granby

Percent of map unit: 5 percent
Landform: Glacial drainage channels, outwash plains, lake plains
Landform position (three-dimensional): Dip, talf
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: Yes

Tedrow

Percent of map unit: 5 percent
Landform: Dunes on outwash plains, dunes on lake plains, beach ridges on outwash plains, beach ridges on lake plains
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Millgrove

Percent of map unit: 5 percent
Landform: Outwash terraces, outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

GnB2—Glynwood loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2v4br
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 7 inches: loam
Bt - 7 to 26 inches: clay
BC - 26 to 30 inches: clay loam
Cd - 30 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 25 to 37 inches to densic material
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Rawson

Percent of map unit: 6 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent

Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

GnC2—Glynwood loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 5nyc
Elevation: 800 to 1,000 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: End moraines, ground moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 20 inches: clay
H3 - 20 to 60 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Severely eroded soils

Percent of map unit: 4 percent

More sloping areas

Percent of map unit: 4 percent

Less sloping areas

Percent of map unit: 4 percent

Pewamo

Percent of map unit: 3 percent
Landform: Drainageways on till plains, drainageways on moraines
Hydric soil rating: Yes

GnD2—Glynwood loam, 12 to 18 percent slopes, eroded

Map Unit Setting

National map unit symbol: 5nyd
Elevation: 800 to 1,000 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: End moraines, ground moraines

Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 20 inches: clay
H3 - 20 to 60 inches: clay loam

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Less sloping areas

Percent of map unit: 4 percent

Severely eroded soils

Percent of map unit: 4 percent

More sloping areas

Percent of map unit: 4 percent

Blount

Percent of map unit: 3 percent
Landform: Rises on end moraines, rises on ground moraines, flats on end moraines, flats on ground moraines
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Linear
Across-slope shape: Linear

GoC3—Glynwood clay loam, 6 to 12 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 5nyf
Elevation: 800 to 1,000 feet
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: End moraines, ground moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 4 inches: clay loam
H2 - 4 to 15 inches: clay
H3 - 15 to 60 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Slightly eroded soils
Percent of map unit: 5 percent

More sloping areas
Percent of map unit: 5 percent

Less sloping areas
Percent of map unit: 5 percent

HkA—Haskins loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 5nyh
Elevation: 600 to 1,300 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 130 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Haskins and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Haskins

Setting
Landform: Till plains, lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over till

Typical profile
H1 - 0 to 9 inches: loam
H2 - 9 to 25 inches: sandy clay loam
H3 - 25 to 60 inches: clay loam

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Forage suitability group: Unnamed (G099XYC-2OH)
Other vegetative classification: Unnamed (G099XYC-2OH)
Hydric soil rating: No

Minor Components

Nappanee

Percent of map unit: 5 percent
Landform: Lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear

Digby

Percent of map unit: 5 percent
Landform: Outwash plains, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Mermill

Percent of map unit: 5 percent
Landform: Drainageways on outwash plains, depressions on outwash plains, drainageways on terraces, depressions on terraces, drainageways on beach ridges, depressions on beach ridges
Hydric soil rating: Yes

HoA—Hoytville clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2wb2m
Elevation: 600 to 820 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Wave-worked till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey lodgment till

Typical profile

Ap - 0 to 8 inches: clay loam
Btg - 8 to 35 inches: clay
BC - 35 to 57 inches: clay loam
Cd - 57 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 45 to 70 inches to densic material
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Forage suitability group: Unnamed (G099XYC-1OH)
Other vegetative classification: Unnamed (G099XYC-1OH)
Hydric soil rating: Yes

Minor Components

Nappanee

Percent of map unit: 8 percent
Landform: Wave-worked till plains
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Houcktown

Percent of map unit: 2 percent
Landform: Wave-worked till plains
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

KfA—Kibbie loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 5nyk
Elevation: 600 to 1,100 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Kibbie and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kibbie

Setting

Landform: Deltas, outwash plains, ground moraines, lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 26 inches: loam
H3 - 26 to 60 inches: stratified fine sand to silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY007MI - Lake Plain Flats
Forage suitability group: Unnamed (G099XYC-1OH)
Other vegetative classification: Unnamed (G099XYC-1OH)

Hydric soil rating: No

Minor Components

Colwood

Percent of map unit: 5 percent
Landform: Drainageways on outwash plains, depressions on outwash plains, drainageways on deltas, depressions on deltas
Hydric soil rating: Yes

Bixler

Percent of map unit: 5 percent
Landform: Beach ridges on outwash plains, beach ridges on lake plains, rises on outwash plains, rises on lake plains
Down-slope shape: Convex
Across-slope shape: Linear

Lenawee

Percent of map unit: 5 percent
Landform: Depressions on deltas, drainageways on deltas, depressions on outwash plains, drainageways on outwash plains
Hydric soil rating: Yes

Mf—Mermill loam

Map Unit Setting

National map unit symbol: 5nyp
Elevation: 600 to 800 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 165 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Mermill and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mermill

Setting

Landform: Drainageways on outwash plains, flats on terraces, drainageways on terraces, flats on beach ridges, drainageways on beach ridges, flats on outwash plains
Parent material: Loamy glaciolacustrine deposits over till

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 32 inches: sandy clay loam
H3 - 32 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Haskins

Percent of map unit: 8 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Millgrove

Percent of map unit: 7 percent
Landform: Outwash terraces, outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Mo—Millgrove loam

Map Unit Setting

National map unit symbol: 5nyq
Elevation: 760 to 1,000 feet
Mean annual precipitation: 27 to 38 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 140 to 198 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Millgrove and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Millgrove

Setting

Landform: Drainageways on beach ridges, flats on beach ridges, drainageways on terraces, flats on terraces, drainageways on outwash plains, flats on outwash plains
Parent material: Outwash

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 35 inches: clay loam
H3 - 35 to 60 inches: stratified gravelly sandy loam to loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Brady

Percent of map unit: 5 percent
Landform: Outwash terraces, outwash plains, beach ridges
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Mermill

Percent of map unit: 5 percent
Landform: Till plains, lake plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Digby

Percent of map unit: 5 percent
Landform: Outwash plains, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

NnA—Nappanee loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 5nyr
Elevation: 600 to 800 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 6 inches: loam
H2 - 6 to 26 inches: clay
H3 - 26 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Drainageways on lake plains, depressions on lake plains
Hydric soil rating: Yes

Surface layer of clay loam to silty clay

Percent of map unit: 5 percent

Haskins

Percent of map unit: 5 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

NnB—Nappanee loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 5nys
Elevation: 600 to 800 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 6 inches: loam
H2 - 6 to 26 inches: clay
H3 - 26 to 60 inches: clay

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Haskins

Percent of map unit: 8 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Surface layer of clay loam to silty clay

Percent of map unit: 7 percent

OrB—Oshtemo loamy sand, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 5nyw
Elevation: 600 to 1,000 feet
Mean annual precipitation: 27 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Oshtemo and similar soils: 85 percent

Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oshtemo

Setting

Landform: Terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Outwash

Typical profile

H1 - 0 to 17 inches: loamy sand
H2 - 17 to 26 inches: sandy loam
H3 - 26 to 46 inches: loamy sand
H4 - 46 to 60 inches: Error

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Minor Components

Spinks

Percent of map unit: 8 percent
Landform: Lake plains, outwash plains, moraines, beach ridges, beach ridges, beach ridges, dunes, dunes, dunes
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Boyer

Percent of map unit: 7 percent
Landform: Stream terraces, moraines, outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

OtB—Ottokee fine sand, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 5nyx
Elevation: 600 to 800 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Ottokee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ottokee

Setting

Landform: Knolls on beach ridges, knolls on lake plains, knolls on moraines, ridges on beach ridges, ridges on lake plains, ridges on moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Parent material: Eolian deposits and/or glaciolacustrine deposits

Typical profile

H1 - 0 to 8 inches: fine sand
H2 - 8 to 60 inches: fine sand
H3 - 60 to 78 inches: fine sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Granby

Percent of map unit: 5 percent
Landform: Depressions on beach ridges, drainageways on beach ridges, depressions on dunes, drainageways on dunes, depressions on moraines, drainageways on moraines
Hydric soil rating: Yes

Tedrow

Percent of map unit: 5 percent
Landform: Dunes on outwash plains, dunes on lake plains, beach ridges on outwash plains, beach ridges on lake plains
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Convex
Across-slope shape: Convex

Gilford

Percent of map unit: 5 percent
Landform: Drainageways on moraines, depressions on moraines, drainageways on dunes, depressions on dunes, drainageways on beach ridges, depressions on beach ridges
Hydric soil rating: Yes

OuB—Ottokee-Glynwood complex, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 5nyy
Elevation: 600 to 1,000 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Ottokee and similar soils: 60 percent
Glynwood and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ottokee

Setting

Landform: Dunes on lake plains, beach ridges on lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Eolian deposits

Typical profile

H1 - 0 to 8 inches: fine sand
H2 - 8 to 60 inches: fine sand
H3 - 60 to 78 inches: fine sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Description of Glynwood

Setting

Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Till

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 20 inches: clay loam
H3 - 20 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: D
Ecological site: F099XY007MI - Lake Plain Flats

Hydric soil rating: No

Minor Components

Fulton

Percent of map unit: 4 percent
Landform: Lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex

Tuscola

Percent of map unit: 3 percent
Landform: Deltas, lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Seward

Percent of map unit: 3 percent
Landform: Beach ridges on till plains, beach ridges on lake plains, dunes on till plains, dunes on lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Linear

PeB—Perrin sandy loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 5nyz
Elevation: 600 to 1,000 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Perrin and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Perrin

Setting

Landform: Outwash plains, valley trains, ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Linear

Across-slope shape: Linear
Parent material: Outwash

Typical profile

H1 - 0 to 12 inches: sandy loam
H2 - 12 to 30 inches: sandy loam
H3 - 30 to 60 inches: stratified gravel to sand

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Millgrove

Percent of map unit: 5 percent
Landform: Depressions on outwash plains, drainageways on outwash plains, depressions on terraces, drainageways on terraces, depressions on beach ridges, drainageways on beach ridges
Hydric soil rating: Yes

Rawson

Percent of map unit: 5 percent
Landform: Lake plains, outwash plains, till plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Digby

Percent of map unit: 5 percent
Landform: Outwash plains, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Pm—Pewamo clay loam

Map Unit Setting

National map unit symbol: 5nz0
Elevation: 600 to 1,400 feet
Mean annual precipitation: 29 to 42 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Drainageways on till plains, flats on moraines, drainageways on moraines, flats on till plains
Parent material: Till

Typical profile

H1 - 0 to 10 inches: clay loam
H2 - 10 to 57 inches: clay
H3 - 57 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 4 percent
Landform: Rises on end moraines, rises on ground moraines, flats on end moraines, flats on ground moraines
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Haskins

Percent of map unit: 3 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Mermill

Percent of map unit: 3 percent
Landform: Till plains, lake plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

RbB—Rawson sandy loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 5nz2
Elevation: 780 to 800 feet
Mean annual precipitation: 27 to 41 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 140 to 208 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Rawson and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rawson

Setting

Landform: Lake plains, outwash plains, till plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Parent material: Outwash over till

Typical profile

H1 - 0 to 19 inches: sandy loam
H2 - 19 to 32 inches: clay loam
H3 - 32 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 30 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Mermill

Percent of map unit: 8 percent
Landform: Drainageways on beach ridges, depressions on beach ridges, drainageways on outwash plains, depressions on outwash plains
Hydric soil rating: Yes

Haskins

Percent of map unit: 7 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

RnA—Rimer loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 5nz3
Elevation: 600 to 800 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 165 days

Farmland classification: Prime farmland if drained

Map Unit Composition

Rimer and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rimer

Setting

Landform: Ridges on beach ridges, ridges on deltas, ridges on outwash plains, knolls on beach ridges, knolls on deltas, knolls on outwash plains
Landform position (two-dimensional): Summit, shoulder
Parent material: Glaciolacustrine deposits over till

Typical profile

H1 - 0 to 9 inches: loamy fine sand
H2 - 9 to 23 inches: fine sand
H3 - 23 to 29 inches: fine sandy loam
H4 - 29 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Blount

Percent of map unit: 3 percent
Landform: Rises on end moraines, rises on ground moraines, flats on end moraines, flats on ground moraines
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Linear
Across-slope shape: Linear

Seward

Percent of map unit: 2 percent
Landform: Beach ridges on till plains, beach ridges on lake plains, dunes on till plains, dunes on lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex

Across-slope shape: Linear

Haskins

Percent of map unit: 2 percent
Landform: Lake plains, till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Mermill

Percent of map unit: 2 percent
Landform: Depressions on beach ridges, depressions on deltas, depressions on outwash plains
Hydric soil rating: Yes

Tedrow

Percent of map unit: 2 percent
Landform: Dunes on outwash plains, dunes on lake plains, beach ridges on outwash plains, beach ridges on lake plains
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Convex
Across-slope shape: Convex

Nappanee

Percent of map unit: 2 percent
Landform: Lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear

Ottokee

Percent of map unit: 2 percent
Landform: Dunes on lake plains, beach ridges on lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Linear

SdB—Seward loamy fine sand, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 5nz4
Elevation: 700 to 1,000 feet
Mean annual precipitation: 27 to 37 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 140 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Seward and similar soils: 85 percent

Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Seward

Setting

Landform: Beach ridges on till plains, beach ridges on lake plains, dunes on till plains, dunes on lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Eolian deposits over till

Typical profile

H1 - 0 to 10 inches: loamy fine sand
H2 - 10 to 22 inches: loamy fine sand
H3 - 22 to 37 inches: sandy loam
H4 - 37 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Wauseon

Percent of map unit: 4 percent
Landform: Depressions on beach ridges, depressions on outwash plains, depressions on deltas
Hydric soil rating: Yes

Rimer

Percent of map unit: 4 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Slopes of more than 6 percent

Percent of map unit: 4 percent

Ottokee

Percent of map unit: 3 percent
Landform: Dunes on lake plains, beach ridges on lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Linear

SfB2—Shinrock silty clay loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 5nz6
Elevation: 600 to 1,000 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Shinrock and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Shinrock

Setting

Landform: Terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits

Typical profile

H1 - 0 to 5 inches: silty clay loam
H2 - 5 to 12 inches: silty clay
H3 - 12 to 60 inches: silty clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F099XY007MI - Lake Plain Flats
Forage suitability group: Unnamed (G099XYA-6OH)
Other vegetative classification: Unnamed (G099XYA-6OH)
Hydric soil rating: No

Minor Components

Latty

Percent of map unit: 5 percent
Landform: Drainageways on lake plains
Hydric soil rating: Yes

Fulton

Percent of map unit: 5 percent
Landform: Lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex

Severely eroded soils

Percent of map unit: 5 percent

Sh—Shoals silt loam, frequently flooded

Map Unit Setting

National map unit symbol: 5nz9
Elevation: 340 to 1,000 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 210 days
Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Shoals and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Shoals

Setting

Landform: Flood plains
Parent material: Alluvium

Typical profile

H1 - 0 to 11 inches: silt loam

H2 - 11 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Very high (about 12.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F099XY008MI - Moist Floodplain
Hydric soil rating: No

Minor Components

Sloan

Percent of map unit: 8 percent
Landform: Drainageways on flood plains, depressions on flood plains
Ecological site: F099XY009MI - Wet Floodplain
Hydric soil rating: Yes

Eel

Percent of map unit: 7 percent
Landform: Flood-plain steps, flood plains
Ecological site: F099XY008MI - Moist Floodplain

So—Sloan silty clay loam, frequently flooded

Map Unit Setting

National map unit symbol: 5nzb
Elevation: 700 to 1,000 feet
Mean annual precipitation: 27 to 41 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 200 days
Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Sloan and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sloan

Setting

Landform: Flats on flood plains, backswamps on flood plains, drainageways on flood plains
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 12 inches: silty clay loam
H2 - 12 to 45 inches: clay loam
H3 - 45 to 60 inches: stratified gravelly sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F099XY009MI - Wet Floodplain
Hydric soil rating: Yes

Minor Components

Shoals

Percent of map unit: 8 percent
Landform: Flood plains
Ecological site: F099XY008MI - Moist Floodplain
Hydric soil rating: No

Eel

Percent of map unit: 7 percent
Landform: Flood-plain steps, flood plains
Ecological site: F099XY008MI - Moist Floodplain
Hydric soil rating: No

TdA—Tedrow loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 5nzg
Elevation: 720 to 790 feet

Mean annual precipitation: 27 to 37 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 140 to 166 days
Farmland classification: Farmland of local importance

Map Unit Composition

Tedrow and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tedrow

Setting

Landform: Dunes on outwash plains, dunes on lake plains, beach ridges on outwash plains, beach ridges on lake plains
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits

Typical profile

H1 - 0 to 9 inches: loamy fine sand
H2 - 9 to 26 inches: loamy fine sand
H3 - 26 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A/D
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Ottokee

Percent of map unit: 8 percent
Landform: Dunes on lake plains, beach ridges on lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Linear

Granby

Percent of map unit: 7 percent

Landform: Drainageways on outwash plains, depressions on outwash plains, drainageways on beach ridges, depressions on beach ridges
Hydric soil rating: Yes

TuB—Tuscola fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 5nzh
Elevation: 500 to 1,000 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Tuscola and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tuscola

Setting

Landform: Deltas, lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 43 inches: silt loam
H3 - 43 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C

Ecological site: F099XY007MI - Lake Plain Flats
Forage suitability group: Unnamed (G099XYA-6OH)
Other vegetative classification: Unnamed (G099XYA-6OH)
Hydric soil rating: No

Minor Components

Galen
Percent of map unit: 5 percent
Landform: Dunes on moraines, dunes on lake plains, beach ridges on moraines, beach ridges on lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Kibbie
Percent of map unit: 5 percent
Landform: Deltas, outwash plains, ground moraines, lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear

Shinrock
Percent of map unit: 5 percent
Landform: Disintegration moraines, lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear

W—Water

Map Unit Composition
Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Wf—Wauseon fine sandy loam

Map Unit Setting
National map unit symbol: 5nzl
Elevation: 680 to 720 feet
Mean annual precipitation: 27 to 37 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 140 to 165 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Wauseon and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wauseon

Setting

Landform: Flats on outwash plains, depressions on outwash plains, flats on beach ridges, depressions on beach ridges, flats on deltas, depressions on deltas
Parent material: Glaciolacustrine deposits over till

Typical profile

H1 - 0 to 13 inches: fine sandy loam
H2 - 13 to 32 inches: fine sandy loam
H3 - 32 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Gilford

Percent of map unit: 5 percent
Landform: Depressions on outwash terraces, depressions on outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Tedrow

Percent of map unit: 5 percent
Landform: Dunes on outwash plains, dunes on lake plains, beach ridges on outwash plains, beach ridges on lake plains
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Mermill

Percent of map unit: 5 percent
Landform: Till plains, lake plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Zie5A—Ziegenfuss clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2qz3g
Elevation: 570 to 790 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Ziegenfuss and similar soils: 86 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ziegenfuss

Setting

Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over loamy till

Typical profile

Ap - 0 to 9 inches: clay loam
Bg - 9 to 30 inches: clay loam
BC - 30 to 40 inches: clay loam
C - 40 to 67 inches: clay loam
2Cd - 67 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 60 to 80 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 28 percent
Maximum salinity: Nonsaline (0.1 to 1.0 mmhos/cm)

Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 9 percent
Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Houcktown

Percent of map unit: 5 percent
Landform: Wave-worked till plains
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Hillsdale County, Michigan

10C2—Hillsdale-Riddles sandy loams, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 31b2m
Elevation: 890 to 1,190 feet
Mean annual precipitation: 31 to 41 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Hillsdale and similar soils: 50 percent
Riddles and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hillsdale

Setting

Landform: End moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Coarse-loamy till

Typical profile

Ap - 0 to 9 inches: sandy loam
E - 9 to 14 inches: sandy loam
Bt - 14 to 38 inches: sandy loam
BC - 38 to 60 inches: sandy loam
C - 60 to 79 inches: sandy loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 8.0
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains

Hydric soil rating: No

Description of Riddles

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: sandy loam
E - 8 to 13 inches: sandy loam
Bt1 - 13 to 23 inches: sandy clay loam
Bt2 - 23 to 42 inches: sandy clay loam
BC - 42 to 55 inches: sandy loam
C - 55 to 79 inches: sandy loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 9.0
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Spinks

Percent of map unit: 9 percent
Landform: Moraines, outwash plains, glacial drainage channels
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, head slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F098XA013MI - Piney Dry Sandy Drift Plains
Hydric soil rating: No

Teasdale

Percent of map unit: 3 percent
Landform: Moraines

Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Rise
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Locke

Percent of map unit: 2 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Barry

Percent of map unit: 1 percent
Landform: Flats on till plains, depressions on moraines, drainageways on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Concave
Across-slope shape: Concave, linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

12B—Williamstown-Conover complex, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 6b8c
Elevation: 580 to 1,200 feet
Mean annual precipitation: 30 to 45 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Williamstown and similar soils: 62 percent
Conover and similar soils: 32 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Williamstown

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise

Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 33 inches: clay loam
H3 - 33 to 60 inches: loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 18 to 39 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Description of Conover

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 27 inches: clay loam
H3 - 27 to 60 inches: loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Minor Components

Steamburg

Percent of map unit: 3 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Wolcott

Percent of map unit: 3 percent
Landform: Ground moraines, depressions
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

18B—Glynwood-Blount complex, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 6b8v
Elevation: 580 to 1,530 feet
Mean annual precipitation: 29 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Glynwood and similar soils: 57 percent
Blount and similar soils: 37 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 26 inches: clay loam
H3 - 26 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Description of Blount

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 32 inches: silty clay loam
H3 - 32 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XB502IN - Wet Till Ridge

Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 3 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Steamburg

Percent of map unit: 3 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

18C2—Morley loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wp26
Elevation: 750 to 1,220 feet
Mean annual precipitation: 32 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 165 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 17 inches: clay

Bt2 - 17 to 28 inches: clay
BC - 28 to 33 inches: clay loam
Cd - 33 to 79 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 24 to 38 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood

Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

19B—Blount loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 2ydcv
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, concave
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 30 inches: silty clay
BC - 30 to 37 inches: clay loam
Cd - 37 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: 26 to 48 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge

Hydric soil rating: No

Minor Components

Glynwood

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 6 percent
Landform: Depressions, ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Conover

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Badaxe

Percent of map unit: 2 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

20—Pewamo silt loam

Map Unit Setting

National map unit symbol: 6b90
Elevation: 580 to 1,530 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 120 to 180 days

Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 11 inches: silt loam
H2 - 11 to 48 inches: clay loam
H3 - 48 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Minor Components

Houghton

Percent of map unit: 1 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Blount

Percent of map unit: 1 percent
Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear

Across-slope shape: Convex
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Glynwood

Percent of map unit: 1 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Lenawee County, Michigan

BbB—Berrien loamy sand, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2b
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BbB2—Berrien loamy sand, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b2c
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien, Moderately Eroded

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BcA—Berrien sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2d
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

BcB—Berrien sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2f
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

BcB2—Berrien sandy loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b2g
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Berrien, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berrien, Moderately Eroded

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB102IN - Lacustrine Forest
Hydric soil rating: No

BdA—Berville loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2j
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Berville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berville

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 24 inches: sandy loam
H3 - 24 to 36 inches: loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BeA—Berville sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2k
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Berville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berville

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 10 inches: sandy loam
H2 - 10 to 24 inches: sandy loam
H3 - 24 to 36 inches: loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BgA—Blount loam and Pewamo clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2q
Elevation: 580 to 1,530 feet
Mean annual precipitation: 29 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 60 percent
Pewamo and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 10 inches: silty clay loam
H3 - 10 to 26 inches: silty clay loam
H4 - 26 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Description of Pewamo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 16 inches: clay loam
H2 - 16 to 32 inches: silty clay loam
H3 - 32 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BhA—Brady sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2r
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Knolls on strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 5 percent
Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BkA—Brady and Macomb loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2s
Elevation: 600 to 1,200 feet

Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 46 percent
Macomb and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Macomb

Setting

Landform: Knolls on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 32 inches: loam

H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 10 percent
Landform: Strand plains, depressions
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BIA—Blount loam, Erie-Huron Lake Plain, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wb29
Elevation: 540 to 850 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Wave-worked till plains, nearshore zones (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Moderately fine-textured lodgment till

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 27 inches: clay
BC - 27 to 37 inches: clay loam
Cd - 37 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 19 to 49 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 7 percent
Landform: Wave-worked till plains, nearshore zones (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Microfeatures of landform position: Open depressions
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Metamora

Percent of map unit: 5 percent
Landform: Wave-worked till plains, nearshore zones (relict)
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Microfeatures of landform position: Rises

Down-slope shape: Linear
Across-slope shape: Linear, convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Selfridge

Percent of map unit: 3 percent
Landform: Wave-worked till plains, nearshore zones (relict)
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Microfeatures of landform position: Rises
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

BmA—Brady and Macomb sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2t
Elevation: 600 to 1,200 feet
Mean annual precipitation: 29 to 37 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brady and similar soils: 46 percent
Macomb and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brady

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: sandy loam
H3 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Description of Macomb

Setting

Landform: Knolls on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 32 inches: loam
H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats

Hydric soil rating: Yes

BnA—Bronson sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2v
Elevation: 500 to 1,200 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Bronson and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bronson

Setting

Landform: Knolls on strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 38 inches: sandy loam
H3 - 38 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F111XB404IN - Dry Outwash Upland

Hydric soil rating: No

Minor Components

Brookston

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BnB—Bronson sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2w
Elevation: 500 to 1,200 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Bronson and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bronson

Setting

Landform: Knolls on strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 38 inches: sandy loam
H3 - 38 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 24 to 42 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Brookston

Percent of map unit: 5 percent
Landform: Depressions on moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BntaaA—Blount loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wp2k
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, concave
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 30 inches: silty clay

BC - 30 to 37 inches: clay loam
Cd - 37 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 28 to 48 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 6 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Conover

Percent of map unit: 4 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Glynwood

Percent of map unit: 3 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Badaxe

Percent of map unit: 2 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

BntaaB—Blount loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2wp2l
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: End moraines, ground moraines
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 28 inches: silty clay
BC - 28 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 26 to 45 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Glynwood, eroded

Percent of map unit: 8 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Conover

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Depressions on end moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Badaxe

Percent of map unit: 2 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, convex
Across-slope shape: Linear
Hydric soil rating: No

BntabB—Blount loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wp2m
Elevation: 660 to 1,130 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount, eroded, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount, Eroded

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 7 inches: loam
Bt - 7 to 24 inches: silty clay
BC - 24 to 30 inches: clay loam
Cd - 30 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 24 to 40 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XB502IN - Wet Till Ridge

Hydric soil rating: No

Minor Components

Glynwood, eroded

Percent of map unit: 8 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Conover

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Depressions, end moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Badaxe

Percent of map unit: 2 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, convex
Across-slope shape: Linear
Hydric soil rating: No

BoA—Brookston loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2x
Elevation: 500 to 1,020 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 130 to 200 days

Farmland classification: Prime farmland if drained

Map Unit Composition

Brookston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brookston

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 23 inches: clay loam
H3 - 23 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

BpA—Brookston loam, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b2y
Elevation: 600 to 900 feet
Mean annual precipitation: 35 to 40 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 150 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Brookston and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brookston

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 18 inches: clay loam
H3 - 18 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 11.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

BsB—Boyer loamy sand, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 5nxy
Elevation: 600 to 970 feet
Mean annual precipitation: 27 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Boyer and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boyer

Setting

Landform: Outwash plains, moraines, stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till over gravelly outwash

Typical profile

H1 - 0 to 17 inches: loamy sand
H2 - 17 to 30 inches: coarse sandy loam
H3 - 30 to 60 inches: gravelly sand

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Minor Components

Spinks

Percent of map unit: 8 percent
Landform: Dunes, dunes, dunes, beach ridges, beach ridges, beach ridges, moraines, outwash plains, lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Oshtemo

Percent of map unit: 7 percent
Landform: Terraces

CaB—Cadmus loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b2z
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CaB2—Cadmus loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b30
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CaracA—Carlisle muck, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2zdl1
Elevation: 700 to 850 feet
Mean annual precipitation: 35 to 41 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Carlisle and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carlisle

Setting

Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material and/or woody organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 79 inches: woody muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very high (about 24.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Minor Components

Linwood

Percent of map unit: 9 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

Pewamo

Percent of map unit: 6 percent
Landform: Depressions on moraines, drainageways on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

CbA—Cadmus sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b31
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

CbB—Cadmus sandy loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b32
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cadmus and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained

Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CbB2—Cadmus sandy loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting
National map unit symbol: 6b33
Elevation: 600 to 1,200 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 140 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Cadmus, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus, Moderately Eroded

Setting
Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile
H1 - 0 to 14 inches: sandy loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities
Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

CcA—Cadmus and Blount loams, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b34
Elevation: 580 to 1,530 feet
Mean annual precipitation: 28 to 42 inches
Mean annual air temperature: 43 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Cadmus and similar soils: 46 percent
Blount and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cadmus

Setting
Landform: Knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile
H1 - 0 to 14 inches: loam
H2 - 14 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Description of Blount

Setting

Landform: Knolls on moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 10 inches: silty clay loam
H3 - 10 to 26 inches: silty clay loam
H4 - 26 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 10 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

CfA—Colwood and Wauseon fine sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b37
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Colwood and similar soils: 51 percent
Wauseon and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colwood

Setting

Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified loamy glaciofluvial deposits

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 34 inches: silt loam
H3 - 34 to 60 inches: stratified fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Wauseon

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

CgA—Conover loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b38
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Colwood

Percent of map unit: 5 percent
Landform: Depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

CgB—Conover loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b39
Elevation: 600 to 1,500 feet
Mean annual precipitation: 25 to 38 inches

Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: clay loam
H3 - 36 to 60 inches: loam

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Colwood

Percent of map unit: 5 percent
Landform: Knolls on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

CnB—Colonie fine sand, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2ljyc
Elevation: 590 to 820 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 140 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Colonie and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colonie

Setting

Landform: Beach ridges on lake plains, dunes on lake plains, longshore bars (relict) on lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Beach sand and/or eolian deposits

Typical profile

Ap - 0 to 8 inches: fine sand
E - 8 to 21 inches: fine sand
E and Bt1 - 21 to 25 inches: fine sand
E and Bt2 - 25 to 68 inches: fine sand
C - 68 to 80 inches: fine sand

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 20.00 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge

Forage suitability group: Unnamed (G139XYB-1OH)
Other vegetative classification: Unnamed (G139XYB-1OH)
Hydric soil rating: No

Minor Components

Tedrow

Percent of map unit: 7 percent
Landform: Dunes on lake plains, longshore bars (relict) on lake plains, beach ridges on lake plains
Landform position (two-dimensional): Backslope, footslope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Granby

Percent of map unit: 1 percent
Landform: Drainageways on longshore bars (relict) on lake plains, depressions on dunes on lake plains, depressions on beach ridges on lake plains, drainageways on beach ridges on lake plains, depressions on longshore bars (relict) on lake plains, drainageways on dunes on lake plains
Landform position (two-dimensional): Backslope, footslope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F099XY011MI - Warm Wet Sandy Depression
Hydric soil rating: Yes

Cr—Corunna sandy loam

Map Unit Setting

National map unit symbol: 68tt
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Corunna and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Corunna

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Metamora

Percent of map unit: 5 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Selfridge

Percent of map unit: 5 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Belleville

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY011MI - Warm Wet Sandy Depression
Hydric soil rating: Yes

DmA—Digby loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 5ny3
Elevation: 780 to 870 feet
Mean annual precipitation: 27 to 37 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 140 to 165 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Digby and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Digby

Setting

Landform: Outwash terraces, outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Outwash

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 32 inches: clay loam
H3 - 32 to 60 inches: stratified gravelly sand to gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY007MI - Lake Plain Flats
Forage suitability group: Unnamed (G099XYC-1OH)
Other vegetative classification: Unnamed (G099XYC-1OH)
Hydric soil rating: No

Minor Components

Haskins

Percent of map unit: 8 percent
Landform: Lake plains, till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Millgrove

Percent of map unit: 7 percent
Landform: Drainageways on beach ridges, depressions on beach ridges, drainageways on terraces, depressions on terraces, drainageways on outwash plains, depressions on outwash plains
Hydric soil rating: Yes

DtA—Dixboro fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 5ny4
Elevation: 600 to 1,000 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Dixboro and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dixboro

Setting

Landform: Lake plains, outwash plains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Rise, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 39 inches: fine sandy loam
H3 - 39 to 60 inches: stratified very fine sand to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Bixler

Percent of map unit: 5 percent
Landform: Rises on lake plains, rises on outwash plains, beach ridges on lake plains, beach ridges on outwash plains
Down-slope shape: Convex
Across-slope shape: Linear

Lamson

Percent of map unit: 5 percent
Landform: Drainageways on outwash plains, depressions on outwash plains, drainageways on deltas, depressions on deltas
Hydric soil rating: Yes

Colwood

Percent of map unit: 5 percent
Landform: Depressions on deltas, drainageways on deltas, depressions on outwash plains, drainageways on outwash plains
Hydric soil rating: Yes

FcA—Fox sandy loam, till plain, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wvh4
Elevation: 650 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox and similar soils: 90 percent
Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Outwash plains, outwash terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest, tread
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loamy glaciofluvial deposits over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified sand to gravel

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: R111XC010IN - Well Drained Overflow, F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB403IN - Outwash Upland
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

FcB—Fox sandy loam, till plain, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2wvh5
Elevation: 650 to 1,250 feet
Mean annual precipitation: 31 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fox and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Outwash plains, outwash terraces
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest, tread
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loamy glaciofluvial deposits over sandy and gravelly outwash

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 27 inches: sandy clay loam
Bt2 - 27 to 33 inches: gravelly loam
2C - 33 to 79 inches: stratified sand to gravel

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 55 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Matherton

Percent of map unit: 6 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Sebewa

Percent of map unit: 4 percent
Landform: Drainageways on stream terraces, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

FdC3—Fox soils, 7 to 15 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 6b3w
Elevation: 580 to 1,300 feet
Mean annual precipitation: 27 to 44 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 125 to 190 days
Farmland classification: Farmland of local importance

Map Unit Composition

Fox, severely eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox, Severely Eroded

Setting

Landform: Ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 15 inches: clay loam
H2 - 15 to 32 inches: clay loam
H3 - 32 to 60 inches: gravelly sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

GaA—Genesee loam, 0 to 2 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: 2z6cv
Elevation: 340 to 1,280 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee, occasionally flooded, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee, Occasionally Flooded

Setting

Landform: Flood-plain steps, natural levees
Landform position (three-dimensional): Tread

Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

Ap - 0 to 8 inches: loam
Bw - 8 to 32 inches: loam
C - 32 to 79 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 30 to 33 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

Minor Components

Eel, frequently flooded

Percent of map unit: 8 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Sloan, occassionally ponded

Percent of map unit: 7 percent
Landform: Depressions, flood-plain steps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Shoals, occasionally flooded

Percent of map unit: 5 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

GcA—Genesee and Eel loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b43
Elevation: 340 to 900 feet
Mean annual precipitation: 30 to 46 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 120 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee and similar soils: 51 percent
Eel and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

Description of Eel

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: loam
H3 - 20 to 60 inches: stratified sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

GeA—Granby sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b45
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Granby and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Granby

Setting

Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciofluvial deposits and/or sandy glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 36 inches: fine sand
H3 - 36 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB401IN - Wet Outwash Mollisol
Hydric soil rating: Yes

GfA—Griffin and Genesee loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b46
Elevation: 580 to 1,000 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Genesee and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Genesee

Setting

Landform: Knolls on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 36 inches: silt loam
H3 - 36 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare

Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F111XB204IN - Dry Alluvium Forest
Hydric soil rating: No

GgA—Griffin and Sloan loams, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b47
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition
Griffin and similar soils: 51 percent
Sloan and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting
Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile
H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None

Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Sloan

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 22 inches: clay loam
H3 - 22 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

GhA—Griffin and Sloan sandy loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b48
Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 130 to 170 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Griffin and similar soils: 51 percent
Sloan and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Griffin

Setting

Landform: Meander scars on flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 26 inches: loam
H3 - 26 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB203IN - Wet Alluvium Forest
Hydric soil rating: No

Description of Sloan

Setting

Landform: Depressions on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 22 inches: clay loam
H3 - 22 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

GoC3—Glynwood clay loam, 6 to 12 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 5nyf
Elevation: 800 to 1,000 feet
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 4 inches: clay loam
H2 - 4 to 15 inches: clay
H3 - 15 to 60 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Slightly eroded soils

Percent of map unit: 5 percent

Less sloping areas

Percent of map unit: 5 percent

More sloping areas

Percent of map unit: 5 percent

Gp—Gravel pits

Map Unit Composition

Gravel pits: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

HaC2—Hillsdale sandy loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b4b
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Hillsdale, moderately eroded, and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hillsdale, Moderately Eroded

Setting

Landform: Ridges on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 16 inches: sandy loam
H3 - 16 to 48 inches: sandy loam
H4 - 48 to 60 inches: sandy loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

HeA—Hoytville clay loam and Rimer sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4g
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 51 percent

Rimer and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Rimer

Setting

Landform: Outwash deltas on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy over clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 7 inches: loamy sand
H2 - 7 to 15 inches: fine sand
H3 - 15 to 30 inches: sandy loam
H4 - 30 to 60 inches: clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

HfA—Hoytville and Wauseon loams, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b4h
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Hoytville and similar soils: 51 percent
Wauseon and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile
H1 - 0 to 7 inches: silt loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Wauseon

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

HgtanA—Houghton muck, disintegration moraine, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 30n5d

Elevation: 650 to 1,070 feet
Mean annual precipitation: 35 to 41 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Houghton, undrained, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton, Undrained

Setting

Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck
Oa2 - 12 to 35 inches: muck
Oa3 - 35 to 79 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very high (about 24.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: R111XB003IN - Deep Muck
Hydric soil rating: Yes

Minor Components

Palms, undrained

Percent of map unit: 8 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck

Hydric soil rating: Yes

Muskego, undrained

Percent of map unit: 7 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R111XB002IN - Limnic Muck
Hydric soil rating: Yes

HoA—Hoytville clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2wb2m
Elevation: 600 to 820 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Wave-worked till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey lodgment till

Typical profile

Ap - 0 to 8 inches: clay loam
Btg - 8 to 35 inches: clay
BC - 35 to 57 inches: clay loam
Cd - 57 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 45 to 70 inches to densic material
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent

Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Forage suitability group: Unnamed (G099XYC-1OH)
Other vegetative classification: Unnamed (G099XYC-1OH)
Hydric soil rating: Yes

Minor Components

Nappanee

Percent of map unit: 8 percent
Landform: Wave-worked till plains
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Houcktown

Percent of map unit: 2 percent
Landform: Wave-worked till plains
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

HsA—Haskins loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 5pqy
Elevation: 600 to 1,300 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 130 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Haskins and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Haskins

Setting

Landform: Lake plains, till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over till

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 23 inches: clay loam
H3 - 23 to 60 inches: clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Forage suitability group: Unnamed (G099XYC-2OH)
Other vegetative classification: Unnamed (G099XYC-2OH)
Hydric soil rating: No

Minor Components

Metamora

Percent of map unit: 4 percent
Landform: Outwash plains, beach ridges
Landform position (three-dimensional): Rise, talf
Down-slope shape: Linear
Across-slope shape: Linear

Digby

Percent of map unit: 4 percent
Landform: Lake plains, till plains
Down-slope shape: Linear
Across-slope shape: Linear

Mermill

Percent of map unit: 4 percent
Landform: Drainageways, depressions
Hydric soil rating: Yes

Nappanee

Percent of map unit: 3 percent
Landform: Lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear

IaA—Ionia loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4j
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ionia and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ionia

Setting

Landform: Knolls on glacial drainage channels
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

IaB—Ionia loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b4k
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ionia and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ionia

Setting

Landform: Knolls on ice-contact slopes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 18 inches: sandy loam
H3 - 18 to 36 inches: sandy clay loam
H4 - 36 to 60 inches: gravelly sand

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

KaC2—Kendallville loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b4m
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

KcC2—Kendallville soils, 7 to 15 percent slopes, moderately or severely eroded

Map Unit Setting

National map unit symbol: 6b4p
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Kendallville, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendallville, Moderately Eroded

Setting

Landform: Knolls on ice-contact slopes
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over till

Typical profile

H1 - 0 to 14 inches: clay loam
H2 - 14 to 28 inches: clay loam
H3 - 28 to 36 inches: gravelly clay loam
H4 - 36 to 60 inches: loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

KdA—Kerston muck and loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4q
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Kerston and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kerston

Setting

Landform: Depressions on flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over alternating layers of alluvium and/or organic material

Typical profile

Oa1 - 0 to 8 inches: muck
Oa2 - 8 to 15 inches: muck
H3 - 15 to 42 inches: stratified fine sand to silty clay loam
O'a - 42 to 50 inches: muck
H5 - 50 to 60 inches: stratified fine sand to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 14.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

KfA—Kokomo and Barry loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4t
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Kokomo and similar soils: 51 percent
Barry and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kokomo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 31 inches: silty clay loam
H3 - 31 to 60 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Barry

Setting
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile
H1 - 0 to 12 inches: loam
H2 - 12 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: sandy loam

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

KgA—Kokomo, Barry, and Wallkill loams, overwashed, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 6b4v
Elevation: 600 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition
Kokomo and similar soils: 40 percent

Barry and similar soils: 30 percent
Wallkill and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kokomo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 31 inches: silty clay loam
H3 - 31 to 60 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Barry

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Description of Wallkill

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over organic material

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: fine sandy loam
Oa - 20 to 60 inches: muck

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 19.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

MaA—Macomb fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b50
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Macomb and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Macomb

Setting

Landform: Drainageways on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 32 inches: sandy clay loam
H3 - 32 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

MbA—Macomb sandy clay loam and Hoytville clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b51
Elevation: 600 to 1,000 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Macomb and similar soils: 51 percent
Hoytville and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Macomb

Setting

Landform: Drainageways on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 32 inches: sandy clay loam
H3 - 32 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

McA—Maumee loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b52
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Maumee and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Maumee

Setting

Landform: Depressions on strand plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy glaciofluvial deposits and/or sandy glaciolacustrine deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 60 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

MhA—Morley loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b5j
Elevation: 580 to 1,400 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Morley and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhB—Glynwood loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2v4bq
Elevation: 700 to 1,060 feet

Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 31 inches: clay
BC - 31 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 28 to 45 inches to densic material
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Rawson

Percent of map unit: 6 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge

Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhB2—Glynwood loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2v4br
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glynwood

Setting

Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 7 inches: loam
Bt - 7 to 26 inches: clay
BC - 26 to 30 inches: clay loam

Cd - 30 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 25 to 37 inches to densic material
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Rawson

Percent of map unit: 6 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: End moraines on till plains, ground moraines on till plains
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 4 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhC—Morley loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2wp25
Elevation: 570 to 1,120 feet
Mean annual precipitation: 32 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 175 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till

Typical profile

Ap - 0 to 9 inches: loam
Bt1 - 9 to 18 inches: clay
Bt2 - 18 to 29 inches: clay
BC - 29 to 35 inches: clay loam
Cd - 35 to 79 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 26 to 40 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C

Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood
Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount
Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo
Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhC2—Morley loam, 6 to 12 percent slopes, eroded

Map Unit Setting
National map unit symbol: 2wp26
Elevation: 750 to 1,220 feet
Mean annual precipitation: 32 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 165 days
Farmland classification: Farmland of local importance

Map Unit Composition
Morley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 17 inches: clay
Bt2 - 17 to 28 inches: clay
BC - 28 to 33 inches: clay loam
Cd - 33 to 79 inches: clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 24 to 38 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Glynwood

Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear

Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Pewamo

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

MhD2—Morley loam, 12 to 25 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b5q
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Moderately Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MkC3—Morley soils, 7 to 15 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 6b5t
Elevation: 580 to 1,020 feet
Mean annual precipitation: 29 to 40 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Morley, severely eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Severely Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 60 inches: clay loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

MkD3—Morley clay loam, 12 to 18 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 2wvhl
Elevation: 720 to 1,120 feet
Mean annual precipitation: 35 to 40 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 160 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Morley, severely eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morley, Severely Eroded

Setting

Landform: Moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 7 inches: clay loam
Bt - 7 to 25 inches: clay
BC - 25 to 33 inches: clay loam
Cd - 33 to 79 inches: clay loam

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: 26 to 45 inches to densic material
Drainage class: Moderately well drained
Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hennepin, severely eroded
Percent of map unit: 7 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Glynwood, severely eroded
Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Blount
Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

MmA—Metamora sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 68ts
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Metamora and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Metamora

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy and/or loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 21 inches: sandy loam
H3 - 21 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Blount
Percent of map unit: 4 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Selfridge
Percent of map unit: 4 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Corunna
Percent of map unit: 4 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Pewamo
Percent of map unit: 3 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Mo—Millgrove loam

Map Unit Setting
National map unit symbol: 5nyq
Elevation: 760 to 1,000 feet
Mean annual precipitation: 27 to 38 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 140 to 198 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Millgrove and similar soils: 85 percent

Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Millgrove

Setting

Landform: Flats on outwash plains, drainageways on outwash plains, flats on terraces, drainageways on terraces, flats on beach ridges, drainageways on beach ridges
Parent material: Outwash

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 35 inches: clay loam
H3 - 35 to 60 inches: stratified gravelly sandy loam to loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Brady

Percent of map unit: 5 percent
Landform: Beach ridges, outwash plains, outwash terraces
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Digby

Percent of map unit: 5 percent
Landform: Outwash terraces, outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Mermill

Percent of map unit: 5 percent
Landform: Lake plains, till plains

Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Mr—Mermill loam

Map Unit Setting

National map unit symbol: 5pr4
Elevation: 600 to 800 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 165 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Mermill and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mermill

Setting

Landform: Outwash plains
Parent material: Loamy glaciolacustrine deposits over till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 23 inches: clay loam
H3 - 23 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Metamora

Percent of map unit: 7 percent
Landform: Outwash plains, beach ridges
Landform position (three-dimensional): Rise, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Haskins

Percent of map unit: 7 percent
Landform: Lake plains, till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Clayey material at a depth of more than 40 inches

Percent of map unit: 6 percent
Landform: Outwash plains
Hydric soil rating: Yes

NaA—Nappanee silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b5x
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam

H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

NaB—Nappanee silt loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b5y
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

NbA—Nappanee loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 68vb
Elevation: 570 to 720 feet

Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 24 inches: clay
H3 - 24 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Metamora

Percent of map unit: 5 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

NbB—Nappanee loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b60
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

NbB2—Nappanee loam, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b61
Elevation: 600 to 800 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee, Moderately Eroded

Setting

Landform: Knolls on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: silty clay
H3 - 20 to 60 inches: silty clay

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F111XB102IN - Lacustrine Forest, F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

NnA—Nappanee loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 5nyr
Elevation: 600 to 800 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 6 inches: loam
H2 - 6 to 26 inches: clay
H3 - 26 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on lake plains, drainageways on lake plains
Hydric soil rating: Yes

Haskins

Percent of map unit: 5 percent
Landform: Lake plains, till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Surface layer of clay loam to silty clay

Percent of map unit: 5 percent

NnB—Nappanee loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 5nys
Elevation: 600 to 800 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 85 percent

Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 6 inches: loam
H2 - 6 to 26 inches: clay
H3 - 26 to 60 inches: clay

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Haskins

Percent of map unit: 8 percent
Landform: Lake plains, till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Surface layer of clay loam to silty clay

Percent of map unit: 7 percent

OrB—Oshtemo loamy sand, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 5nyw
Elevation: 600 to 1,000 feet
Mean annual precipitation: 27 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Oshtemo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oshtemo

Setting

Landform: Terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Outwash

Typical profile

H1 - 0 to 17 inches: loamy sand
H2 - 17 to 26 inches: sandy loam
H3 - 26 to 46 inches: loamy sand
H4 - 46 to 60 inches: Error

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Minor Components

Spinks

Percent of map unit: 8 percent
Landform: Dunes, dunes, dunes, beach ridges, beach ridges, beach ridges, moraines, outwash plains, lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Boyer

Percent of map unit: 7 percent
Landform: Outwash plains, moraines, stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

PbA—Pewamo clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t6lz
Elevation: 700 to 1,060 feet
Mean annual precipitation: 34 to 38 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 205 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pewamo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on till plains, drainageways on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Parent material: Wisconsin till derived from limestone and shale

Typical profile

Ap - 0 to 11 inches: clay loam
Btg1 - 11 to 34 inches: clay
Btg2 - 34 to 47 inches: clay loam
BCg - 47 to 57 inches: clay loam
Cg - 57 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 8 percent
Landform: Ground moraines on till plains, end moraines on till plains
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear, concave
Across-slope shape: Linear
Ecological site: F111XB502IN - Wet Till Ridge
Hydric soil rating: No

Brookston

Percent of map unit: 4 percent
Landform: Drainageways on till plains, depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Concave
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

Palms, undrained

Percent of map unit: 3 percent
Landform: Depressions on moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R111XB001IN - Mineral Muck
Hydric soil rating: Yes

PcA—Pewamo mucky clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6b
Elevation: 600 to 1,400 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Pewamo and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pewamo

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: mucky silty clay loam
H2 - 7 to 32 inches: clay loam
H3 - 32 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XB501IN - Till Depression
Hydric soil rating: Yes

PdA—Plainfield and Berrien loamy sands, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b6c
Elevation: 600 to 1,150 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 51 percent
Berrien and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains

Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

PdB—Plainfield and Berrien loamy sands, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 6b6d
Elevation: 600 to 1,150 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 51 percent
Berrien and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise

Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY004MI - Warm Dry Sandy Ridge
Hydric soil rating: No

Description of Berrien

Setting

Landform: Strand plains on till-floored lake plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits over loamy lacustrine deposits and/or loamy till

Typical profile

H1 - 0 to 6 inches: loamy sand
H2 - 6 to 60 inches: loamy sand
H3 - 60 to 65 inches: clay loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

PeB2—Plainfield and Ottawa loamy sands, 3 to 7 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6h
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield, Moderately Eroded

Setting

Landform: Strand plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland

Hydric soil rating: No

PeC2—Plainfield and Ottawa loamy sands, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6k
Elevation: 720 to 1,150 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield, moderately eroded, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield, Moderately Eroded

Setting

Landform: Beach ridges
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 36 inches: loamy sand
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F111XB404IN - Dry Outwash Upland
Hydric soil rating: No

PrB—Perrin sandy loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 5nyz
Elevation: 600 to 1,000 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Perrin and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Perrin

Setting

Landform: Ground moraines, valley trains, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Outwash

Typical profile

H1 - 0 to 12 inches: sandy loam
H2 - 12 to 30 inches: sandy loam
H3 - 30 to 60 inches: stratified gravel to sand

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: B
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Rawson

Percent of map unit: 5 percent
Landform: Till plains, outwash plains, lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Millgrove

Percent of map unit: 5 percent
Landform: Drainageways on beach ridges, depressions on beach ridges, drainageways on terraces, depressions on terraces, drainageways on outwash plains, depressions on outwash plains
Hydric soil rating: Yes

Digby

Percent of map unit: 5 percent
Landform: Outwash terraces, outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

RnA—Rimer loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 5prj
Elevation: 600 to 800 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 165 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Rimer and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rimer

Setting

Landform: Lake plains, till plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy glaciolacustrine deposits over till

Typical profile

H1 - 0 to 10 inches: loamy fine sand
H2 - 10 to 24 inches: loamy fine sand
H3 - 24 to 31 inches: fine sandy loam
H4 - 31 to 64 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Haskins

Percent of map unit: 4 percent
Landform: Lake plains, till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Metamora

Percent of map unit: 4 percent
Landform: Outwash plains, beach ridges
Landform position (three-dimensional): Rise, talf
Down-slope shape: Linear
Across-slope shape: Linear

Seward

Percent of map unit: 4 percent
Landform: Dunes on lake plains, dunes on till plains, beach ridges on lake plains, beach ridges on till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Linear

Wauseon

Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

RsB—Rawson sandy loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 5nz2
Elevation: 780 to 800 feet
Mean annual precipitation: 27 to 41 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 140 to 208 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Rawson and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rawson

Setting

Landform: Till plains, outwash plains, lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Outwash over till

Typical profile

H1 - 0 to 19 inches: sandy loam
H2 - 19 to 32 inches: clay loam
H3 - 32 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 30 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Mermill

Percent of map unit: 8 percent
Landform: Depressions on outwash plains, drainageways on outwash plains, depressions on beach ridges, drainageways on beach ridges
Hydric soil rating: Yes

Haskins

Percent of map unit: 7 percent
Landform: Lake plains, till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

SdC—St. Clair loam, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: 6b6w
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

St. clair and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 7 to 15 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

SdC2—St. Clair loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6x
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

St. clair, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair, Moderately Eroded

Setting

Landform: Ground moraines

Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

SdD2—St. Clair loam, 12 to 25 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6y
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches

Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

St. clair, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair, Moderately Eroded

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

SeC3—St. Clair soils, 7 to 15 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 6b71
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

St. clair, severely eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair, Severely Eroded

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, crest, base slope
Down-slope shape: Convex, linear
Across-slope shape: Concave, convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: clay loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge

Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

Sg—Sewage lagoons

Map Unit Composition

Sewage lagoons: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Sm—Shoals silt loam, frequently flooded

Map Unit Setting

National map unit symbol: 5nz9
Elevation: 340 to 1,000 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 210 days
Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Shoals and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Shoals

Setting

Landform: Flood plains
Parent material: Alluvium

Typical profile

H1 - 0 to 11 inches: silt loam
H2 - 11 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Very high (about 12.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F099XY008MI - Moist Floodplain
Hydric soil rating: No

Minor Components

Sloan

Percent of map unit: 8 percent
Landform: Depressions on flood plains, drainageways on flood plains
Ecological site: F099XY009MI - Wet Floodplain
Hydric soil rating: Yes

Eel

Percent of map unit: 7 percent
Landform: Flood plains, flood-plain steps
Ecological site: F099XY008MI - Moist Floodplain

So—Sloan silty clay loam, frequently flooded

Map Unit Setting

National map unit symbol: 5nzb
Elevation: 700 to 1,000 feet
Mean annual precipitation: 27 to 41 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 200 days
Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Sloan and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sloan

Setting

Landform: Drainageways on flood plains, backswamps on flood plains, flats on flood plains

Parent material: Loamy alluvium

Typical profile

H1 - 0 to 12 inches: silty clay loam
H2 - 12 to 45 inches: clay loam
H3 - 45 to 60 inches: stratified gravelly sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F099XY009MI - Wet Floodplain
Hydric soil rating: Yes

Minor Components

Shoals

Percent of map unit: 8 percent
Landform: Flood plains
Ecological site: F099XY008MI - Moist Floodplain
Hydric soil rating: No

Eel

Percent of map unit: 7 percent
Landform: Flood plains, flood-plain steps
Ecological site: F099XY008MI - Moist Floodplain
Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

WaA—Wallkill loam, overwashed, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b73
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Wallkill and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wallkill

Setting

Landform: Depressions on flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over organic material

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 20 inches: fine sandy loam
Oa - 20 to 60 inches: muck

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 19.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XB201IN - Wet Alluvium Floodplain
Hydric soil rating: Yes

WawabB—Wawasee loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2wp1x
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 9 inches: loam
Bt1 - 9 to 24 inches: loam
Bt2 - 24 to 33 inches: clay loam
C - 33 to 79 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawabC—Wawasee loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2wvgl
Elevation: 670 to 1,180 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: loam
Bt1 - 8 to 24 inches: loam

Bt2 - 24 to 33 inches: clay loam
C - 33 to 79 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains
Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WawacC—Wawasee loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wvgm
Elevation: 670 to 1,180 feet

Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Farmland of local importance

Map Unit Composition

Wawasee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wawasee

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 7 inches: loam
Bt1 - 7 to 23 inches: loam
Bt2 - 23 to 31 inches: clay loam
C - 31 to 79 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F098XA015MI - Dry Loamy Drift Plains
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 9 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F098XA011MI - Moist Loamy Drift Plains

Hydric soil rating: No

Brookston

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F098XA012MI - Wet Loamy Depressions
Hydric soil rating: Yes

WcA—Wauseon loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b75
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Wauseon and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wauseon

Setting

Landform: Depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent

Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Ws—Wauseon fine sandy loam

Map Unit Setting

National map unit symbol: 6fgh
Elevation: 570 to 980 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Wauseon and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wauseon

Setting

Landform: Depressions on ground moraines, depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

H1 - 0 to 10 inches: fine sandy loam
H2 - 10 to 33 inches: sandy loam
H3 - 33 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Ypsi

Percent of map unit: 3 percent
Landform: Drainageways on till-floored lake plains, drainageways on ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Hoytville

Percent of map unit: 3 percent
Landform: Depressions on lake plains, depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Gilford

Percent of map unit: 3 percent
Landform: Depressions on valley trains, depressions on strand plains, depressions on lake plains, depressions on deltas
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Pewamo

Percent of map unit: 3 percent
Landform: Depressions on moraines, depressions on till plains, depressions on till-floored lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Lamson

Percent of map unit: 3 percent
Landform: Depressions on outwash deltas, depressions on lake plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

ZfsacA—Ziegenfuss clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2qz3g
Elevation: 570 to 790 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Ziegenfuss and similar soils: 86 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ziegenfuss

Setting

Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over loamy till

Typical profile

Ap - 0 to 9 inches: clay loam
Bg - 9 to 30 inches: clay loam
BC - 30 to 40 inches: clay loam
C - 40 to 67 inches: clay loam
2Cd - 67 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 60 to 80 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 28 percent
Maximum salinity: Nonsaline (0.1 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats

Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 9 percent
Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Houcktown

Percent of map unit: 5 percent
Landform: Wave-worked till plains
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Lucas County, Ohio

DgA—Digby sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 5pqj
Elevation: 780 to 870 feet
Mean annual precipitation: 27 to 37 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 140 to 165 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Digby and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Digby

Setting

Landform: Outwash plains, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Outwash

Typical profile

H1 - 0 to 12 inches: sandy loam
H2 - 12 to 40 inches: sandy clay loam
H3 - 40 to 60 inches: stratified sand to gravelly sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F099XY007MI - Lake Plain Flats
Forage suitability group: Unnamed (G099XYC-1OH)
Other vegetative classification: Unnamed (G099XYC-1OH)
Hydric soil rating: No

Minor Components

Dixboro

Percent of map unit: 5 percent
Landform: Outwash plains, lake plains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Rise, talf
Down-slope shape: Linear
Across-slope shape: Linear

Colwood

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Hydric soil rating: Yes

Tedrow

Percent of map unit: 5 percent
Landform: Dunes on outwash plains, dunes on lake plains, beach ridges on outwash plains, beach ridges on lake plains
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Convex
Across-slope shape: Convex

Ee—Eel loam, occasionally flooded

Map Unit Setting

National map unit symbol: 5pqq
Elevation: 340 to 1,000 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 120 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Eel and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Eel

Setting

Landform: Flood plains
Parent material: Alluvium

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 33 inches: loam
H3 - 33 to 60 inches: stratified sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F099XY008MI - Moist Floodplain
Hydric soil rating: No

Minor Components

Sloan

Percent of map unit: 7 percent
Landform: Drainageways, depressions
Hydric soil rating: Yes

Shoals

Percent of map unit: 7 percent
Landform: Flood plains
Ecological site: F099XY008MI - Moist Floodplain

Soils on slightly higher areas

Percent of map unit: 6 percent

HnA—Haskins loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 5pqy
Elevation: 600 to 1,300 feet
Mean annual precipitation: 27 to 42 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 130 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Haskins and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Haskins

Setting

Landform: Till plains, lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over till

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 23 inches: clay loam
H3 - 23 to 60 inches: clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Forage suitability group: Unnamed (G099XYC-2OH)
Other vegetative classification: Unnamed (G099XYC-2OH)
Hydric soil rating: No

Minor Components

Mermill

Percent of map unit: 4 percent
Landform: Depressions, drainageways
Hydric soil rating: Yes

Digby

Percent of map unit: 4 percent
Landform: Till plains, lake plains
Down-slope shape: Linear
Across-slope shape: Linear

Metamora

Percent of map unit: 4 percent
Landform: Beach ridges, outwash plains
Landform position (three-dimensional): Rise, talf
Down-slope shape: Linear
Across-slope shape: Linear

Nappanee

Percent of map unit: 3 percent
Landform: Lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear

HoA—Hoytville clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2wb2m
Elevation: 600 to 820 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Wave-worked till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey lodgment till

Typical profile

Ap - 0 to 8 inches: clay loam
Btg - 8 to 35 inches: clay
BC - 35 to 57 inches: clay loam
Cd - 57 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 45 to 70 inches to densic material
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Forage suitability group: Unnamed (G099XYC-1OH)
Other vegetative classification: Unnamed (G099XYC-1OH)
Hydric soil rating: Yes

Minor Components

Nappanee

Percent of map unit: 8 percent
Landform: Wave-worked till plains
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Houcktown

Percent of map unit: 2 percent
Landform: Wave-worked till plains
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Mf—Mermill loam

Map Unit Setting

National map unit symbol: 5pr4
Elevation: 600 to 800 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 165 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Mermill and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mermill

Setting

Landform: Outwash plains
Parent material: Loamy glaciolacustrine deposits over till

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 23 inches: clay loam
H3 - 23 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Metamora

Percent of map unit: 7 percent
Landform: Beach ridges, outwash plains
Landform position (three-dimensional): Rise, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Haskins

Percent of map unit: 7 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Clayey material at a depth of more than 40 inches

Percent of map unit: 6 percent
Landform: Outwash plains
Hydric soil rating: Yes

MmA—Metamora sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 5pr6
Elevation: 600 to 1,200 feet
Mean annual precipitation: 27 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Metamora and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Metamora

Setting

Landform: Beach ridges, outwash plains
Landform position (three-dimensional): Rise, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy outwash over till

Typical profile

H1 - 0 to 9 inches: sandy loam
H2 - 9 to 23 inches: sandy loam
H3 - 23 to 31 inches: clay loam
H4 - 31 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Mermill

Percent of map unit: 4 percent
Landform: Depressions, drainageways
Hydric soil rating: Yes

Digby

Percent of map unit: 4 percent
Landform: Outwash plains, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Haskins

Percent of map unit: 4 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Rimer

Percent of map unit: 3 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

NnA—Nappanee loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 5pr8
Elevation: 600 to 800 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit, shoulder

Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile
H1 - 0 to 8 inches: loam
H2 - 8 to 25 inches: clay
H3 - 25 to 60 inches: clay

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Clay loam or silty clay surface layer
Percent of map unit: 5 percent

Hoytville
Percent of map unit: 5 percent
Landform: Depressions, drainageways
Hydric soil rating: Yes

Haskins
Percent of map unit: 5 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Metamora
Percent of map unit: 5 percent
Landform: Beach ridges, outwash plains
Landform position (three-dimensional): Rise, talf
Down-slope shape: Linear
Across-slope shape: Linear

RnA—Rimer loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 5prj
Elevation: 600 to 800 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 165 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Rimer and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rimer

Setting

Landform: Till plains, lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy glaciolacustrine deposits over till

Typical profile

H1 - 0 to 10 inches: loamy fine sand
H2 - 10 to 24 inches: loamy fine sand
H3 - 24 to 31 inches: fine sandy loam
H4 - 31 to 64 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Seward

Percent of map unit: 4 percent
Landform: Beach ridges on till plains, beach ridges on lake plains, dunes on till plains, dunes on lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Linear

Haskins

Percent of map unit: 4 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Metamora

Percent of map unit: 4 percent
Landform: Beach ridges, outwash plains
Landform position (three-dimensional): Rise, talf
Down-slope shape: Linear
Across-slope shape: Linear

Wauseon

Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

SdB—Seward loamy fine sand, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 5prl
Elevation: 700 to 1,000 feet
Mean annual precipitation: 27 to 37 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 140 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Seward and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Seward

Setting

Landform: Beach ridges on till plains, beach ridges on lake plains, dunes on till plains, dunes on lake plains

Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Eolian deposits over till

Typical profile

H1 - 0 to 15 inches: loamy fine sand
H2 - 15 to 32 inches: fine sand
H3 - 32 to 34 inches: fine sandy loam
H4 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Rimer

Percent of map unit: 7 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Slopes of more than 6 percent

Percent of map unit: 7 percent

Ottokee

Percent of map unit: 6 percent
Landform: Dunes on lake plains, beach ridges on lake plains
Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Linear

Sh—Shoals loam, occasionally flooded

Map Unit Setting

National map unit symbol: 5prm
Elevation: 340 to 1,000 feet
Mean annual precipitation: 27 to 46 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Shoals and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Shoals

Setting

Landform: Flood plains
Parent material: Alluvium

Typical profile

H1 - 0 to 13 inches: loam
H2 - 13 to 34 inches: silty clay loam
H3 - 34 to 60 inches: stratified sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 11.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F099XY008MI - Moist Floodplain
Hydric soil rating: No

Minor Components

Ceresco

Percent of map unit: 5 percent

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY008MI - Moist Floodplain

Sloan
Percent of map unit: 5 percent
Landform: Depressions, drainageways
Hydric soil rating: Yes

Eel
Percent of map unit: 5 percent
Landform: Flood-plain steps, flood plains
Ecological site: F099XY008MI - Moist Floodplain

So—Sloan loam, occasionally flooded

Map Unit Setting
National map unit symbol: 5prs
Elevation: 700 to 1,000 feet
Mean annual precipitation: 27 to 41 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Sloan and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sloan

Setting
Landform: Flood plains
Parent material: Alluvium

Typical profile
H1 - 0 to 12 inches: loam
H2 - 12 to 36 inches: loam
H3 - 36 to 67 inches: stratified loam to silty clay loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Occasional
Frequency of ponding: None

Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F099XY009MI - Wet Floodplain
Hydric soil rating: Yes

Minor Components

Shoals

Percent of map unit: 7 percent
Landform: Flood plains
Ecological site: F099XY008MI - Moist Floodplain
Hydric soil rating: No

More clay in the surface layer and subsoil

Percent of map unit: 7 percent
Landform: Flood plains
Ecological site: F099XY009MI - Wet Floodplain
Hydric soil rating: Yes

Eel

Percent of map unit: 6 percent
Landform: Flood-plain steps, flood plains
Ecological site: F099XY008MI - Moist Floodplain
Hydric soil rating: No

StC2—St. Clair loam, 7 to 15 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 6b6x
Elevation: 600 to 1,300 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

St. clair, moderately eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair, Moderately Eroded

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side slope, base slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 23 inches: clay
H3 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F111XE503IN - Till Ridge
Hydric soil rating: No

Minor Components

Hoytville

Percent of map unit: 5 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XB101IN - Lacustrine Flatwood
Hydric soil rating: Yes

SuC2—St. Clair silty clay loam, 4 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 5prv
Elevation: 600 to 1,300 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

St. clair and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair

Setting

Landform: Lake plains, end moraines, ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 2 inches: silty clay loam
H2 - 2 to 21 inches: clay
H3 - 21 to 60 inches: clay

Properties and qualities

Slope: 4 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Severely eroded areas

Percent of map unit: 5 percent

Slopes of more than 12 percent

Percent of map unit: 5 percent

Nappanee

Percent of map unit: 5 percent
Landform: Lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear

SuE3—St. Clair silty clay loam, 12 to 25 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 5prw
Elevation: 600 to 1,300 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

St. clair and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Clair

Setting

Landform: Lake plains, end moraines, ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

H1 - 0 to 2 inches: silty clay loam
H2 - 2 to 21 inches: clay
H3 - 21 to 60 inches: clay

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Slopes of less than 12 percent
Percent of map unit: 4 percent

Moderately eroded areas
Percent of map unit: 4 percent

Slopes of more than 25 percent
Percent of map unit: 4 percent

Nappanee
Percent of map unit: 3 percent
Landform: Lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear

Uo—Udorthents, loamy

Map Unit Setting
National map unit symbol: 5ps3
Elevation: 520 to 710 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition
Udorthents, loamy, and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Loamy

Properties and qualities
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Minor Components

Areas filled with building material
Percent of map unit: 5 percent

Clayey areas
Percent of map unit: 5 percent

Highways
Percent of map unit: 5 percent

Sandy areas
Percent of map unit: 5 percent

Sanitary landfill
Percent of map unit: 5 percent

W—Water

Map Unit Composition
Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Zie5A—Ziegenfuss clay loam, 0 to 1 percent slopes

Map Unit Setting
National map unit symbol: 2qz3g
Elevation: 570 to 790 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Ziegenfuss and similar soils: 86 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ziegenfuss

Setting
Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over loamy till

Typical profile
Ap - 0 to 9 inches: clay loam
Bg - 9 to 30 inches: clay loam
BC - 30 to 40 inches: clay loam
C - 40 to 67 inches: clay loam
2Cd - 67 to 80 inches: clay loam

Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: 60 to 80 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 28 percent
Maximum salinity: Nonsaline (0.1 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 9 percent
Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Houcktown

Percent of map unit: 5 percent
Landform: Wave-worked till plains
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Monroe County, Michigan

13A—Blount loam, Erie-Huron Lake Plain, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wb29
Elevation: 540 to 850 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Blount and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blount

Setting

Landform: Wave-worked till plains, nearshore zones (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Moderately fine-textured lodgment till

Typical profile

Ap - 0 to 9 inches: loam
Bt - 9 to 27 inches: clay
BC - 27 to 37 inches: clay loam
Cd - 37 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 19 to 49 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Pewamo

Percent of map unit: 7 percent
Landform: Wave-worked till plains, nearshore zones (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Microfeatures of landform position: Open depressions
Down-slope shape: Linear, concave
Across-slope shape: Concave, linear
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Metamora

Percent of map unit: 5 percent
Landform: Wave-worked till plains, nearshore zones (relict)
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Linear, convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Selfridge

Percent of map unit: 3 percent
Landform: Wave-worked till plains, nearshore zones (relict)
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Microfeatures of landform position: Rises
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

24—Corunna sandy loam

Map Unit Setting

National map unit symbol: 68tt
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Corunna and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Corunna

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 34 inches: sandy loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Minor Components

Selfridge

Percent of map unit: 5 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Metamora

Percent of map unit: 5 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Belleville

Percent of map unit: 5 percent
Landform: Depressions on till plains

Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY011MI - Warm Wet Sandy Depression
Hydric soil rating: Yes

43A—Nappanee loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 68vb
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Nappanee and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nappanee

Setting

Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey till

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 24 inches: clay
H3 - 24 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: C/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Metamora
Percent of map unit: 5 percent
Landform: Knolls on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

44A—Wasepi sandy loam, loamy substratum, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 68vc
Elevation: 570 to 720 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 160 days
Farmland classification: Farmland of local importance

Map Unit Composition
Wasepi and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wasepi

Setting
Landform: Knolls on outwash deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile
H1 - 0 to 7 inches: sandy loam
H2 - 7 to 21 inches: sandy loam
H3 - 21 to 46 inches: sand
H4 - 46 to 60 inches: silty clay loam

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Minor Components

Tedrow

Percent of map unit: 5 percent
Landform: Knolls on outwash deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Thetford

Percent of map unit: 5 percent
Landform: Knolls on outwash deltas
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Metamora

Percent of map unit: 5 percent
Landform: Outwash deltas on till plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

100A—Hoytville and Wauseon loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 6b4h
Elevation: 700 to 1,200 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Hoytville and similar soils: 51 percent
Wauseon and similar soils: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoytville

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 36 inches: silty clay
H3 - 36 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

Description of Wauseon

Setting

Landform: Depressions on till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over clayey till

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats
Hydric soil rating: Yes

118A—Rimer loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 5prj
Elevation: 600 to 800 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 165 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Rimer and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rimer

Setting

Landform: Lake plains, till plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy glaciolacustrine deposits over till

Typical profile

H1 - 0 to 10 inches: loamy fine sand
H2 - 10 to 24 inches: loamy fine sand
H3 - 24 to 31 inches: fine sandy loam
H4 - 31 to 64 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY003MI - Warm Moist Sandy Depression
Hydric soil rating: No

Minor Components

Seward

Percent of map unit: 4 percent
Landform: Dunes on lake plains, dunes on till plains, beach ridges on lake plains, beach ridges on till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Linear

Haskins

Percent of map unit: 4 percent
Landform: Lake plains, till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Metamora

Percent of map unit: 4 percent
Landform: Outwash plains, beach ridges
Landform position (three-dimensional): Rise, talf
Down-slope shape: Linear
Across-slope shape: Linear

Wauseon

Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

ZfsacA—Ziegenfuss clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2qz3g
Elevation: 570 to 790 feet
Mean annual precipitation: 28 to 38 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Ziegenfuss and similar soils: 86 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ziegenfuss

Setting

Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till over loamy till

Typical profile

Ap - 0 to 9 inches: clay loam
Bg - 9 to 30 inches: clay loam
BC - 30 to 40 inches: clay loam
C - 40 to 67 inches: clay loam
2Cd - 67 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 60 to 80 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 28 percent
Maximum salinity: Nonsaline (0.1 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F099XY013MI - Wet Lake Plain Flats

Hydric soil rating: Yes

Minor Components

Blount

Percent of map unit: 9 percent
Landform: Wave-worked till plains
Landform position (three-dimensional): Talf
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

Houcktown

Percent of map unit: 5 percent
Landform: Wave-worked till plains
Microfeatures of landform position: Rises
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F099XY007MI - Lake Plain Flats
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf