

**Standish Township
Drinking Water State Revolving
Fund Project Plan**

**WATER DISTRIBUTION MAIN FROM WHITES BEACH TO
THE CITY OF PINCONNING**

PREPARED FOR:

STANDISH TOWNSHIP

ARENAC COUNTY, MICHIGAN

DRAFT: FOR REVIEW & COMMENT

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1.0 INTRODUCTION

The purpose of the Standish Township Drinking Water Revolving Fund Project Plan is to fulfill the project planning requirements under the States’ Safe Drinking Water Act 399 and to provide the basis for ranking of the Township’s proposed waterworks improvements under a Project Priority List for a low-interest Drinking Water Revolving Fund Loan.

The scope of the project plan includes a summary of the existing water quality and reliability issues within the Township’s service area, projection of the population served within the next 20 years, identification of principal alternatives to meet the future water needs of the service area, and evaluation of environmental impacts resulting from completion of a selected alternative in both the long and the short term.

The project plan also presents projected user costs for financing the selected alternative and a review of the public participation and public comments solicited by the Township on the selected alternative.

The format of the report follows the January 2023 project planning guidelines for Drinking Water Revolving Fund Projects issued by the Michigan Department of Environmental Quality (MDEQ), now referred to as the Michigan Department of Environment, Great Lakes, and Energy (EGLE).

2.0 PROJECT BACKGROUND

2.1 DELINEATION OF SERVICE AREA

The Study Area includes the White’s Beach area. No other areas within Standish Township have municipal watermain and are serviced by on-site wells. A map of the approximate service area can be found in Appendix E in the Proposed Improvement Options Map.

2.2 LAND USE

A majority of Standish Township is zoned for agricultural use as well as forest & recreation. The White’s Beach area where the current water system is located is the commercially zoned area in the township. Along Lake Huron is zoned lakeshore. The current Zoning Map from the Master Plan is included in Appendix E.

The Township Master Plan adopted in 2022 indicates future land use is similar to existing uses. A goal of the Master Plan is to expand the commercial districts to expand economic activity by providing goods and services to local residents as well as tourists. The Future Land Use map from the Master Plan is included in Appendix E for reference.

2.3 POPULATION PROJECTIONS

The Township of Standish has a total of 235 Residential Equivalent Units (REUs) in 2022.

Table 1 summarizes the current and projected populations for the Township of Standish. Historical population data indicates an increase in population from 2000 to 2010 and then a decline since 2010 for Standish Township. Arenac County decreased from 2000 to 2013, with an increase from 2013 to 2020. The Michigan Bureau of Labor Market Information and Strategic Initiatives projects the population of Arenac County to decline over the next 20 years. It is assumed that the population trend for Standish Township will be similar to that of Arenac County.

Table 1. Population Data and Projections									
	2000	2010	2013	2020	2025	2030	2035	2040	2045
Standish Township	2,026	2,077	1,831	1,690	1,690	1,689	1,679	1,654	1,616
Annual % Change	-	0.25%	-3.95%	-1.10%	0.00%	-0.01%	-0.06%	-0.15%	-0.23%
Arenac County	17,269	15,871	14,707	15,051	15,051	15,042	14,956	14,725	14,382
Annual % Change	-	-0.81%	-2.44%	0.33%	0.00%	-0.01%	-0.06%	-0.15%	-0.23%

It should be noted that the White's Beach community does see an increase in population during the summer months due to the location being near Lake Huron. This population increase leads to more use of the water and sewer systems during these months.

2.4 EXISTING ENVIRONMENT EVALUATION

2.4.1 Cultural Resources

A search of the Michigan State Housing Development Authority Historic Sites Online website indicated no State or Federal listed historic sites in Standish Township. The closest is in the City of Omer, which is around 3.5 miles away from Standish Township. It is over 8 miles away from the service area of this project. The identified historic sites in the City of Omer is the Omer Masonic Hall.

A letter requesting review with respect to impacts to known historical and archeological sites will be sent to the State Historic Preservation Office (SHPO).

Letters requesting review with respect to impacts on tribally important cultural or religious sites will be sent to all of the Native American tribes associated with Arenac County.

2.4.2 The Natural Environment

Climate

Climatological data for the area is based on information from the U.S. Climate Data website. The average January climatic conditions include average minimum temperatures of 11° F and average maximum temperatures of 29° F. The average July climatic conditions include average minimum temperatures of 55° F and average maximum temperatures of 81° F. The average rainfall is 31.19 inches per year.

These climate conditions, specifically the winter conditions and design frost levels, would have equal design and construction impacts on all the principal alternatives and equally affect the length of construction seasons for all alternatives.

Air Quality

Air quality impacts due to construction dust and emissions in the area due to construction equipment would be temporary and similar for the principal alternatives.

Wetlands

A wetlands map was generated at the USFWS National Wetlands Inventory website. The map is included in Appendix E.

It is not anticipated that this project will have any long-term impacts on area wetlands. The wetlands adjacent to the WWTP site will not be affected during the construction of the improvements.

A request for review of any potential impacts to land-water interfaces will be sent to EGLE.

The proper permits will be acquired before construction commences.

Great Lakes Shorelands, Coastal Zones, and Coastal Management Areas

White's Beach is located along within a Coastal Management Area. The proposed project, main pump station and force main to the City of Pinconning, will not be within the Coastal Management Area. Therefore, impacts to these resources are not expected for the proposed project. A map of Arenac and Bay County's Coastal Zone Management Area can be found in Appendix E.

Floodplains

The proposed watermain connection will go through floodplain areas. The areas for potential flooding are areas close to Lake Huron, Saganing River and the Pinconning River. The project will be completed using directional drilling or trenchless technology methods. The online FEMA Floodplain Map Viewer was used and the floodplain map indicates that the area has potential flood hazards. The map is included in Appendix E. Appropriate permits will be acquired before any construction commences.

A request for review of any potential impacts to floodplains will be sent to EGLE.

Natural or Wild and Scenic Rivers

The Wild and Scenic Rivers Act, as amended by the Michigan Scenic Rivers Act of 1991, prohibits federal assistance to a project which will have a direct and adverse effect on the values for which a river segment listed in the National Wild and Scenic Rivers System or designated for study on the National Rivers Inventory was established.

Rivers located within Standish Township are not listed on the National Wild and Scenic Rivers System website, administered by the National Park System, or on the Michigan Natural Rivers System found on the Michigan Department of Natural Resources website.

Major Surface Waters

The most noticeable natural feature near the proposed drinking water system improvements are the Saganing and Pinconning Rivers as well as Lake Huron. The Saganing and Pinconning Rivers flow into Lake Huron. These bodies of water provide recreational opportunities and aesthetic beauty to the area.

Recreational Facilities

The Township has numerous recreational possibilities. The facilities include the Eagle Bay Marina, the Wigwam Bay Wildlife Area, and the Pine River Boat Launch.

The State of Michigan owns and maintains the Standish Roadside Park along M-13. The state owned "Iron Bell Trail" also runs through Standish Township. This trail is currently 71% complete.

The Township is responsible for maintaining the cemetery and township hall. Standish Township also contributes to the Standish Historical Depot and Welcome Center in the City of Standish.

No improvements proposed in this Plan are anticipated to impact any of these facilities.

The Standish Township Master Plan updated in 2022 was referenced to obtain the recreational facilities information.

Topography and Geology

The existing topography from the USGS quadrangle map is shown in Appendix E. The elevations in Standish Township vary from 600 to 625 feet.

The regional geology for the area is based on a review of the Quaternary Geology of Michigan Map (W.R. Farrand, 1982) and the Bedrock Geology of Michigan Map (MDNR Geological Survey Division, 1987). Both are located in Appendix E.

The general geology of Standish Township is characterized by Lacustrine sand and gravel. The shoreline of the Township, however, is Lacustrine clay and silt.

Soil Types

The USDA National Resources Conservation Service soil map for the area of proposed construction is located in Appendix E. Soil located at the site are mainly sand and loam.

Agricultural Resources

The Farmland Classification soil types in the area of proposed construction are included in Appendix E.

Because the improvements are limited to the road ROW's, the proposed project principal alternatives are not anticipated to have impacts on agricultural resources.

Fauna and Flora

According to the USFWS Official Species List, there are two federally listed endangered species, one proposed endangered species, and five threatened species in the area. The endangered species in the area include the Indiana Bat and Piping Plover. The threatened species in the area include the Northern Long-eared Bat, Red

Knot, Eastern Massasauga, Eastern Prairie Fringed Orchid and Pitcher's Thitcher. A copy of the list is included in Appendix F.

Because the proposed work is limited to road ROW's, it was determined that no impacts to federally listed endangered or threatened species are anticipated.

A request to MNFI will be sent to confirm that no State listed species would be impacted.

Unique Natural Features

A request will be sent to the MNFI for review considering potential impacts to rare species or unique natural features.

National Natural Landmarks

There are no natural landmarks within the service area of the project. The closest natural landmark is Tobico Marsh, located 10 miles south of the City of Pinconning.

2.5 WATER DEMAND AND EXISTING FACILITIES

2.5.1 Condition of Source Facilities

The community currently does not have a source facility.

2.5.2 Water Treatment Methods

The community currently does not have water treatment.

2.5.3 Existing Storage Facilities

The community does not have any storage facilities currently.

2.5.4 Condition of Service Lines

The service lines are in good condition because the system is brand new.

2.5.5 Existing Distribution and Transmission System

The distribution system is in good condition because the system is brand new. The community does not have a transmission main currently from Whites Beach to the City of Pinconning.

2.5.6 Methods of Residual Handling and Disposal

The Township does not currently have any residuals.

2.5.7 Condition of Water Meters

The water meters are brand new and in excellent condition.

2.5.8 Operation and Maintenance

There is no current operation and maintenance being conducted as the system has not yet been commissioned for service.

2.5.9 Design Capacity of Existing Waterworks System

The City of Pinconning will be allocating up to 75,000 gallons of drinking water per day to the Whites Beach area. The system is designed only for domestic use and not fire protection.

2.5.10 Climate Resiliency of System

Changes resulting from Climate factors will not influence this project and are not applicable.

2.6 SUMMARY OF PROJECT NEEDS

The proposed project consists of:

- Obtaining water treatment either by a new treatment plant or regional connection
- Obtain water source either by wells, new intake from Saginaw Bay, or regional connection

2.6.1 Compliance with Drinking Water Standards

The service area for the DWSRF Project Plan includes the White's Beach area. Currently, the Standish water supply system is not operational. When completed, the Standish water supply system will serve a population of approximately 600 people. There are 235 Residential Equivalent Units in the White's Beach area.

Because there is no current municipal water system, the Township has not been cited with any violations. In 2015, however, it was determined that roughly 70% of existing wells and septic systems were failing because of E-coli that was found after the Michigan DEQ (now EGLE) took soil samples at different locations around Whites Beach. The Township was informed by MDEQ that they needed to find a solution to this problem and were notified by the health department that permits would no longer be issued. At dimensions of 25' x 70', these lots are too small to construct both a new septic system and well. Many owners in the White's Beach area due own more than one lot, however the current standards still make it hard to find enough space for the new construction. Many of the current septic systems were built by whatever means necessary. This makes it hard to replace the existing wells while following the new health standards.

Based on past source supply sampling/monitoring, there has been no known acute or non-acute violations of the Maximum Contaminant Levels (MCL) within the Whites Beach area.

2.6.2 Orders / Enforcement Actions

There is an enforcement action in place to provide a potable water source for the Whites Beach area where the Township has constructed a new water distribution system this past year.

2.6.3 Drinking Water Quality

The Township does not currently have a municipal water system. Residents receive water from private individual wells. These private wells have an extensive number of violations which include but are not limited to failed bacteriological samples as well as lack of proper isolation distance from a contamination source. The quality of groundwater in the White's Beach area is considered bad to poor. Most residents do not drink the water, or use it to cook or launder.

The Township has recently installed a water system in the Whites Beach area. No one can use the system because they do not have a potable water source.

2.7 PROJECTED FUTURE NEEDS

The greatest need for the Standish Township water system is finding a water source and water treatment.

3.0 ANALYSIS OF ALTERNATIVES

The EGLE Project Plan preparation guidance document requires that the alternatives evaluation process examine the objectives of the project, including the needs, technical constraints and applicable drinking water standard requirements to be met. The widest variety of potential alternatives for both the entire system and the various functional subsystems must be identified, evaluated, and screened. All the alternatives evaluated must serve the same service area population with demonstrated drinking water needs. The rationale for rejecting any of these alternatives must be provided in the Plan. In-depth analysis will only be performed for the principal alternatives. The in-depth analysis must be based on a cost-effective analysis, potential environmental impacts, implementability, and technical issues.

The following alternatives were considered for the Township DWSRF Project and service area:

- Alternative 1 – No action
- Alternative 2 – Install Wells and Treatment
- Alternative 3 – Connect to the Saginaw Midland Municipal Water Supply Corporation and Construct a Treatment Plant
- Alternative 4 – Construct a New Intake from Saginaw Bay and Construct a New Treatment Plant
- Alternative 5 – Connect to the City of Standish (Regional)
- Alternative 6 – Connect to the City of Pinconning (Regional)
- Alternative 7 – Connect to the Saginaw Chippewa Indian Tribe in Saganing (Regional)

3.1 ALTERNATIVE 1 - NO ACTION

Under the no action alternatives, the people of the White's Beach area would have to continue using their existing wells. This would lead to continued use of potentially contaminated water due to their failing septic systems, small lot sizes and shallow wells. This alternative will no longer be evaluated as a principal alternative.

3.2 ALTERNATIVE 2 - INSTALL WELLS AND TREATMENT

In this alternative, a minimum of two wells will be used to supply the White's Beach area. A treatment plant and elevator storage tank will be required along with a generator and controls. The township may need to purchase land for the wells, treatment plant and storage tank. The water quality of groundwater in the area is poor and unreliable. This alternative will no longer be evaluated as a principal alternative.

3.3 ALTERNATIVE 3 - CONNECT TO THE SAGINAW MIDLAND MUNICIPAL WATER SUPPLY CORPORATION AND CONSTRUCT A TREATMENT PLANT

In this alternative, a 12" untreated watermain would be connected to the SMMWSC raw water transmission line. This raw water would need to be treated at the new treatment plant that would serve the Whites Beach area. An elevated storage tank would also be required. The township may need to purchase land for the treatment plant and storage tank.

3.4 ALTERNATIVE 4 - CONSTRUCT A NEW INTAKE FROM SAGINAW BAY AND CONSTRUCT A NEW TREATMENT PLANT

This option would require an 18" raw water intake placed in the Saginaw Bay as well as 12" raw watermain that would run from the intake to the new treatment plant. An elevated storage tank would also be required. The benefit of this option is Whites Beach is located right on the Saginaw Bay. The township may need to purchase land for the treatment plant and storage tank.

3.5 ALTERNATIVE 5 - CONNECT TO THE CITY OF STANDISH (REGIONAL)

The Whites Beach area would be connected to the City of Standish by means of a water line that would be installed from the Southeast corner of the City of Standish to the Whites Beach area. There would be a master meter installed at the point of connection to the City of Standish which would measure the volume of water used by the Whites Beach area. This would require approximately 5.2 miles of watermain, a ground storage tank, and a connection to the existing water system that has been installed in the Whites Beach area. This alternative was not considered due to the fact that the water rate that would be charged to the Whites Beach area would be double the rate that the City of Standish charges their residents which over the life cycle of the system would be unaffordable for the Whites Beach residents.

3.6 ALTERNATIVE 6 - CONNECT TO THE CITY OF PINCONNING (REGIONAL)

The Whites Beach area would be connected to the City of Pinconning by means of a water line that would be installed from the Northeast corner of the City of Pinconning to the Whites Beach area. There would be a master meter installed at the point of connection to the City of Pinconning which would measure the volume of water used by the Whites Beach area. This would require approximately 6.8 miles of watermain, a ground storage tank, and a connection to the existing water system that has been installed in the Whites Beach area.. This is the favorable alternative because the Whites Beach area will be charged the same rate as the in-city customers for the City of Pinconning. The Township was able to acquire a 40 year service with the City of Pinconning to provide potable water.

3.7 ALTERNATIVE 7 - CONNECT TO THE SAGINAW CHIPPEWA INDIAN TRIBE IN SAGANING (REGIONAL)

In this alternative, the White's Beach area would connect its water system to existing Saganing Eagle Landing Casino water system. The casino is located approximately 1.0 mile away from the White's Beach area. This is the closest regional alternative, however the Saginaw Chippewa Indian Tribe (SCIT) in Saganing would not agree to a long term contract making this alternative not feasible. This alternative will no longer be evaluated as a principal alternative.

3.8 WATER MAIN CONSTRUCTION METHOD ALTERNATIVES

The Township has two water main construction method alternatives to evaluate for water main and service line replacements.

3.8.1 Construction Method Alternative #1: Open Cut

The open-cut trench method involves excavating a trench down to the appropriate line and grade and placing the pipe. The trench is then backfilled with appropriate material, and a paving course is placed on the surface. Driveways will need to be replaced. Ditches and pavement will have to be restored.

3.8.2 Construction Method Alternative #2: Directional Drilling

Directional drilling (commonly referred to simply as *drilling*) is the process of using a small, steer-able steel pipe that is guided under the soil to create a pilot hole. The pipe is guided by above-grade monitoring equipment that tracks the depth and location. Once the guided head reaches its location, the host pipe is attached and pulled back through the pilot hole. This alternative eliminates costly restoration for driveways, ditches, and lawn areas that is required for the open cut method.

3.9 DELIVERY METHODS

The Township has reviewed various methods for delivering the construction of their project. EGLE has published the State Revolving Fund and Drinking Water Revolving Fund Project Delivery Methods Guidance Document in March 2015. The various delivery methods allowed include Design Bid Build (DBB), Construction Management at Risk (CMAR), Fixed-Price Design-Build (FPDB), and Progressive Design-Build (PDB).

The Township has reviewed all four methods. Summarized comparisons of these methods are outlined below.

3.9.1 Design-Bid-Build (DBB)

Many public infrastructure projects are delivered using the DBB method. In the DBB method, an engineer works closely with the Township and prepares the project bidding documents, including the construction drawings and specifications.

General contractors submit bids based on the plans and specifications, and the lowest, responsible bidder is awarded the project. The general contractor pricing includes their subcontractors, or trade contractors, to perform specialized work such as electrical/controls, mechanical work, concrete work, etc. Typically, the engineering firm that developed the design provides construction observation and construction administration services during the construction phase. In this alternative, there are three parties: the Owner, the engineer, and the general contractor.

The DBB method offers the following advantages:

- Well understood and accepted.
- Independent oversight of Builder.
- Open to Owner involvement during design.

On the other hand, the DBB method has the following disadvantages:

- Pricing is not known until the design process is complete.
- Contractor selected based on low bid not on value, knowledge, and experience brought to the team.

3.9.2 Construction Management At-Risk (CMAR)

CMAR is similar to DBB in that the engineering/design contract is separate from the construction contract. However, in the CMAR method, a construction management firm (CM) is hired independently by the Township before or early on in the design process. An engineer works closely with the Township and the CM during the entire design process. The CM provides input to the engineer and Owner through the entire design process. The engineer prepares the construction drawings and specifications while the CM prepares the bidding documents and obtains pricing from their subcontractors and suppliers.

The CM develops a Guaranteed Maximum Price (GMP). In this alternative, there are three parties: the Owner, the engineer, and the independently contracted CM firm.

The CMAR method offers the following advantages:

- Open to Owner involvement during design.
- Early integration of Builder.
- Provides early and continuous constructability review.
- Provides early certainty of costs.
- Pricing and design may be conducted in parallel.
- Reduced likelihood of claims compared to the DBB alternative.
- Project can be ready for construction quickly.

On the other hand, the CMAR method has the following disadvantages:

- Not a single source of responsibility.
- No legal obligation linking Designer to Builder.
- Potential for disputes, claims and change orders.

3.9.3 Fixed Price Design Build (FPDB)

FPDB is a delivery method where the Owner designates one firm, a design-builder (DB), under one contract for the design and construction of the project. The DB provides a fixed price based on a defined scope, requirements, and schedule but before complete preparation of detailed design documents.

Owner involvement during the design process is typically very limited after the fixed price is accepted. The “book is closed” on pricing around the 30% mark of the design process.

This Township is increasing rates dramatically for this project and has indicated they want to be heavily involved in the design process to provide direction on design options to reduce overall cost. They will be involved throughout the entire design and construction process. Therefore, FPDB was not considered further for this project.

3.9.4 Progressive Design Build (PDB)

The PDB delivery method is similar to the CMAR method but with one major distinction – the design-builder (DB) is under one contract for design and construction of the project. Therefore, the Township has one single firm responsible for the design, schedule, construction, and warrantee of the project. If issues arise during or after construction, the Township only has one entity it would need to address them with.

During the latter part of the design phase, the DB prepares the bidding documents and obtains pricing from its subcontractors and suppliers on an open-book basis.

If an agreement is reached on the pricing, the Township will move forward collaboratively to construction. With such flexibility, the PDB method allows the Owner to improve the project outcome by participating directly in design decisions. In this alternative, there are two parties: the Owner and the DB firm.

The PDB delivery method offers the following advantages:

- The Owner can transfer more risk to the DB, since there is a single point of responsibility for the design, permitting, construction, and performance warrantee of the project.
- Owner is involved during the entire design and construction.
- Early integration of Builder.
- Provides early and continuous constructability review.
- Provides early certainty of costs.
- Pricing and design may be conducted in parallel.
- Project can be ready for construction quickly.

4.0 PRINCIPAL ALTERNATIVES

The no action, new wells, City of Standish and SCIT alternatives were not considered as these were not reliable options. Multiple feasible principal alternatives were developed that meet the project objectives which included the Intake, SMMWSC, and the City of Pinconning options. These alternatives are analyzed further and are summarized in the following sections.

4.1 MONETARY EVALUATION

A monetary evaluation includes a present worth analysis. This analysis does not identify the source of funds but compares cost uniformly for each alternative over the 20-year planning period. The present worth is the sum which, if invested now at a given interest rate, would provide the equivalent amount of funding required to pay all present and future costs. The total present worth, used to compare the principal alternatives, is the sum of the initial capital cost, plus the present worth of operation, maintenance, and replacement (OM&R) costs, minus the present worth of the salvage value at the end of the 20-year planning period. The discount rate used in computing the present worth cost is established by EGLE and has not yet been set for FY2024 SRF Projects. The discount rate of 2.0%, obtained from OMB Circular No. A-94 per SRF guidance, was used for the financial calculations.

The salvage value is calculated at the end of 20 years where portions of the project structures or equipment may have a salvage value, which is determined by using a straight-line depreciation. The present worth of the 20-year salvage value is then computed using the discount rate of 2.0%. The EGLE guidance document establishes the estimated life for the project structures and equipment to assess salvage values at the 20-year planning period.

The cost of labor, equipment and materials is not escalated over the 20-year life since it assumes any increase in these costs will apply equally to all alternatives. Energy prices, however, are escalated at a uniform rate of 3% per year over the 20-year planning period with O&M costs.

Since the total estimated construction costs are similar between the principal alternatives, the interest charge during construction (capitalized interest) would not influence the comparison of alternatives and was not included in the cost-effective analysis.

To ensure uniformity of the cost comparisons, the EGLE guidance indicates that the following cost comparison details should be specifically addressed and were applied in the present worth analysis:

- Capital costs were included for all identified improvements.
- Sunk costs were excluded from the present worth cost. Sunk costs for the project include existing land, existing waterworks facilities, and outstanding bond indebtedness.
- Operations, maintenance, and replacement, (OM&R) costs were included in the present worth cost.
- The economic comparison is based on a 20-year planning period in accordance with EGLE guidance and a discount interest rate of -2.0%
- Salvage values were included in the present worth cost.
- Escalation of energy values was applicable to the principal alternatives, but the cost differences between alternatives were limited.
- Land purchase/acquisition costs were not applicable to the principal alternatives.
- Mitigation costs are included in the project costs, which was included in the present worth cost.
- Total existing and projected user costs for the project are presented.

- Equivalent alternatives were compared, where no principal alternative was substantially more effective in terms of population served, design life of facilities and level of service provided.

The table below compares the costs for different principal Alternatives.

Summary of Alternatives – Net Present Worth Analysis			
	Pinconning	Intake	Sag/Mid
Project Cost	\$7,300,000	\$7,312,500	\$5,200,000
Annual OM&R Cost	\$95,200	\$185,000	\$185,000
Net Present Worth of OM&R Cost*	\$1,556,656	\$3,025,015	\$3,025,015
Total Present Worth	\$8,756,656	\$10,337,515	\$8,225,015
Present Worth of Salvage Value	\$2,907,236	\$2,952,662	\$2,099,671
Net Present Worth	\$5,849,420	\$7,384,853	\$6,125,345

4.2 ENVIRONMENTAL IMPACTS

An analysis of the potential environmental and public health impacts of the principal alternatives is also an important part of the Project Plan analysis.

The following aspects of the environmental setting along with appropriate narrative discussion and maps are presented as follows:

4.2.1 Cultural Resources

None of the alternatives discussed are expected to have any impact upon historical or archeological sites.

4.2.2 The Natural Environment

None of the alternatives are expected to have a significant impact on wetlands, flood plains, surface water, prime farmlands, air quality and plant / animal communities. No alternative will impact wild or scenic rivers designated by the Michigan Department of Environment, Great Lakes, and Energy (EGLE).

Alternative 6 would include directional drilling of watermain within the City right-of-way. Some road replacement is anticipated with this alternative as required to install the watermain. During construction, the potential would exist for site runoff and soil erosion, however soil erosion control measures will be enforced. No trees are proposed to be removed due to this alternative.

The primary potential environmental impacts identified for this project (regardless of the selected construction method alternative) include temporary decreased air quality due to dust from construction sites, temporary noise from construction activities, temporary traffic flow restrictions, and close proximity to designated wetlands and floodplains (but without any anticipated impacts on them).

The open cut construction method alternative would have much more of an environmental impact than the drilling method would. The open cut method would involve digging trenches over the entire new watermain length, while the drilling method would involve excavating holes in the ground at long intervals from each other, then drilling new watermain between each hole.

The significantly larger amount of excavation required for the open cut method than excavation required for the drilling method is the primary reason for the open cut method’s larger potential environmental impact. The open cut method would produce larger amounts of dust, as excavation would occur over the entire new watermain length, rather than at comparatively small, isolated sites. Similarly, the open cut method would

create more noise, as construction activities would occur over the entire new watermain length, rather than at individual work sites spaced far apart. The open cut method would require more disruption to traffic flow, as long lengths of road, possibly covering both traffic directions, would need to be closed, rather than short lengths of road with closures for only one side of the road. The open cut method has a higher potential to impact adjacent wetlands and floodplains, as it would produce larger amounts of excess dirt that, if not contained properly, could enter the wetlands or create obstructions to floodplains (e.g. by getting blown around by the wind).

4.3 TECHNICAL CONSIDERATIONS

4.3.1 System Reliability

The principal alternatives evaluated would meet the engineering principles and comply with the reliability requirements of the Michigan Safe Drinking Act, Act 399.

4.3.2 Residuals

No residuals will be generated in any of the alternatives.

4.3.3 Industrial/Commercial/Institutional Usage

There is one business located in the White's Beach area. This business is a small restaurant that will not impact the necessary capacity needed.

4.3.4 Growth Capacity

The proposed alternatives meet the needed capacity for the year 2043.

5.0 SELECTED ALTERNATIVES

The objectives of the drinking water system improvements project are identified as:

- Establish reliable treated drinking water service to the customers.
- Provide facilities capable of providing consistent compliance with regulatory and permit requirements.
- Minimize financial overburden to the water system users.
- Minimize environmental impact during construction of the improvements project.

Each feasible alternative that met the project objectives was reviewed for effectiveness, reliability, implementability, environmental impacts, and cost effectiveness.

The present worth analysis determined Alternative 6 had the lowest long-term user rates. The City of Pinconning had sufficient treatment capacity for future growth.

The City of Pinconning has offered rates that are more favorable than the City of Standish.

Additional discussion of Selected Alternative presented below.

5.1 DESIGN PARAMETERS

5.1.1 Water Source & Treatment Improvement Alternatives

The White's Beach area will receive water from the City of Pinconning. A directionally drilled 6" watermain will be used in this alternative. The City of Pinconning's water system is located approximately 6.8 miles away from the White's Beach area. Road and driveway replacement will be required where necessary. The initial ground storage tank will have a storage volume of 32,000 gallons and is being designed to accommodate up to 75,000 gallons in the future. There will be one railroad crossing. The master meter pit needs to be installed so the City of Pinconning can charge Standish Township accordingly.

5.1.2 Water Main Construction

The drilling alternative (Construction Method Alternative #2) is the chosen alternative for new watermain construction because it is the best financial and most implementable option. This method is also anticipated to have the smallest impacts to the environment, traffic, facilities, and customers themselves.

Appendix E shows a map with the proposed watermain connection.

The Township and engineering firm that developed the Project Plan had discussions regarding the available watermain construction methods and advantages and disadvantages offered by each method to develop the preferred method for presentation at the Public Hearing.

For the current improvements, the Township and engineer has decided to use directional drilling (Construction Method Alternative #2).

5.1.3 Delivery Method

The Township and engineering firm that developed the Project Plan had discussions regarding the available project delivery methods and advantages and disadvantages offered by each method to develop the preferred method for presentation at the Public Hearing.

For the current improvements, the Township and engineer will discuss which delivery method is most appropriate for this project and will be determined prior to the commencement of construction.

5.2 USEFUL LIFE

The useful life of residential and small commercial meters is 15 years. Meter boxes have a useful life of 25 years. It is anticipated that hydrants & blow offs last 30 years. The useful life of the watermain is 50 years.

5.3 WATER AND ENERGY EFFICIENCY

The water piping will be sized to keep velocities to a minimum, thus keeping the horsepower required to pressurize the system to a minimum. Repumping of the water is not necessary which saves on capital and operation expenses.

5.4 SCHEDULE

The table below presents the proposed project schedule, which follows the DWSRF FY2023 Quarter 4 milestone schedule, assuming that funds will be available in FY2024. Dates are subject to change pending the final DWSRF milestone schedule.

Milestone	Date
Hold Public Hearing	May 2023
Submit Final Project Plan to EGLE	June 1, 2023
Receive approval of Project	August 2023
Environmental Assessment Published	April 2024
Part I and Part II Application Due	May 2024
Bid Advertisement	May 2024
Part III application Due	July 2024
EGLE Order of Approval Issued	August 2024
MFA Closing	August 2024
Notice to Proceed	October 2024
Construction Complete	December 2025
O&M Manual, Startup Assistance, and Record Drawings	February 2026

5.5 COST SUMMARY

Cost estimates for the proposed improvements are provided in Appendix A. The project costs include construction costs, construction contingencies, and professional services for legal, administrative, and project engineering costs. The total cost for this project is \$7.3 million.

5.6 USER COSTS

User costs from this project were analyzed. The Township will fund water supply and treatment operations through user fees billed to the customer communities based on the total REUs for each community. The customer communities then distribute these charges to individual water users.

Using an interest rate of 2.75% annually over 20 years, the estimated annual debt service for Selected Alternative is \$479,404.

Using an interest rate of 2.75% annually over 30 years, the estimated annual debt service for Selected Alternative is \$360,506.

The average cost to users to finance the proposed drinking water system improvements entirely through the CWSRF Program is estimated at \$128.00 to \$170.00 per month per Residential Equivalent Unit (REU) based on a 30-year to 20-year loan respectively.

Actual monthly costs will vary depending on the final DWSRF loan amount, potential ARP Grant funding, potential principal forgiveness, finance terms, interest rates and other potential Federal or State Grants. Actual principal forgiveness eligibility will not be determined by EGLE until later in the project scoping stages.

The exact increase in a customer’s water bill will depend on REU variability and the customer community’s existing rate structure. A Municipal Financial Advisor should be consulted to confirm and refine these rates.

5.7 OVERBURDENED COMMUNITY STATUS

Part 53, of the NREPA, provides for several benefits to municipalities who meet the state’s criteria for overburdened community status. Those benefits include additional priority points and extended loan terms. The Overburdened Community Status Determination Worksheet from SRF is included in Appendix C. Although the

selected alternative was a regional option, Standish Township will be the only municipality providing the funds for the project. Because Standish Township will most likely qualify for Overburdened Community Status, the potential raise in user costs could have serious repercussions. Principal loan forgiveness or grants from EGLE would help mitigate some of these repercussions.

5.8 ABILITY TO IMPLEMENT THE SELECTED ALTERNATIVE

Implementation of a selected alternative is the responsibility of Standish Township. Standish Township will own, operate, and finance the connection to the City of Pinconning's water system. A service agreement and contract is being finalized between the City of Pinconning and Standish Township.

The Township Board selected an alternative at the May 8th, 2023 Public Hearing. A copy of the resolution is included in Appendix D.

6.0 ENVIRONMENTAL AND PUBLIC HEALTH IMPACTS

6.1 DESCRIPTION OF THE IMPACTS

The potential environmental impacts of the Selected Alternative are evaluated in this section of the project plan. The analyses of impacts are divided into direct, indirect, and cumulative impacts. Direct environmental impacts are those that are directly attributable to the construction and operation of the project. Indirect impacts are caused by the project but are removed in time and/or distance and are often considered secondary in nature. Cumulative impacts are those impacts that increase in magnitude over time, or result from individually minor, but collectively significant actions.

6.1.1 Beneficial and Adverse Impacts

A discussion of the full range of potential impacts (i.e., direct, indirect and cumulative) must identify the nature of the impacts in terms of both beneficial and adverse impacts. The following section will describe the impacts resulting from the Selected Alternative with special emphasis on cultural or environmentally sensitive resources.

6.1.2 Short-Term and Long-Term Impacts

The analysis includes trade-offs between short-term uses and the maintenance enhancement of long-term productivity and vice versa.

6.1.3 Irreversible or Irretrievable Resources

The analysis of the environmental impacts also includes any irreversible commitments or use of irretrievable resources, such as the commitment of construction materials, energy, and land to the proposed project.

6.2 DIRECT IMPACTS

Direct impacts are the social and environmental impacts directly attributable to the construction and operation of the project. The effects of the proposed project are considered for each of the following factors:

6.2.1 Construction Impacts

Natural and Man-made Features

Because construction is confined to the road ROW's, impacts during construction to both natural features should be kept to a minimum. For man-made features, any impact to existing roads or other structures will be handled in a timely manner following the completion of construction in that area.

Natural Setting and Sensitive Ecosystems

The Selected Alternative is not anticipated to impact any sensitive ecosystems. Floodplains, wetlands, stream crossings, shorelands, and prime/unique agricultural lands are not anticipated to be disturbed.

Construction Methods

Directionally drilling will be used for this project. This will keep disturbance to the surrounding areas to a minimum.

Species

No direct impact to rare, threatened or endangered species is anticipated. A list of the threatened and endangered species near the project area can be found in Appendix F.

Historic, Archaeological, Geological, Cultural or Recreational

An application for a Section 106 Review will be sent to the Environmental Review Coordinator at the State Historic Preservation Office.

Typically, on a project not affecting historically significant structures themselves, the SHPO focuses on disturbance to the surrounding landscape. Removal of mature trees and significant alterations of the existing landscape may affect a property's overall aesthetic value and therefore its ability to be listed on the federal register.

The proposed project construction will be within road ROW's, therefore minimal disturbances to the surrounding landscape is anticipated.

Traffic Impacts

A minor impact on local traffic may occur during the construction of the proposed project, including potential delays.

Existing and Future Quality of Surface Water and Groundwater

A primary goal of the project is to provide reliable water supply to the system's users. The proposed project is not anticipated to cause changes to the quality of nearby surface or groundwater. It is anticipated dewatering will not be required during this project. If encountered, it will be local to wherever the connections of directionally drilled pipe are located. The dewatering will be kept to a minimum and will not have an impact on any nearby wells or wetlands nearby.

Consumption of Materials, Land, Energy

Construction materials, public funds, energy and manpower will be consumed to construct the proposed improvements. No known shortage of these items exists, nor is it expected that a shortage of these items will result from implementing this project.

The only chemicals used during the construction would be fertilizers used after the seeding and mulching of disturbed areas from the construction operations.

Energy (both electrical and fossil fuels) will be used during the construction of the improvements.

Air Quality and Noise Impacts

During construction, equipment will increase local noise and dust levels during operations. There will be a short-term adverse impact on air quality during the construction phase due to dust and construction equipment emissions generated during the minimal excavation operations.

6.2.2 Operational Impacts

The operational impact of this project will be beneficial to the study area. By making treated drinking water available, the White's Beach drinking water system will be complete and residents will no longer have to use local groundwater from wells that has been contaminated from failing septic fields.

Public Funds, energy and manpower will be consumed to operate the proposed improvements. No known shortage of these items exists, nor is it expected that a shortage of these items will result from implementing this project.

No residential areas will be impacted by the operation of this project. No other operational impacts such as odors, noise, traffic or accidents should occur either.

6.2.3 Social Impacts

There will be no dislocation of people during the construction. Minimal impact to residents is anticipated because the construction work would occur within the road ROW's.

Employment of some residents by the contractor(s) is a possibility for certain construction operations.

Another social impact will be the increased user costs. Additional grant funding will help lessen the impact of user costs.

6.3 INDIRECT IMPACTS

Indirect impacts are those caused by the proposed project but removed in time and/or distance. Indirect impacts are often secondary in nature and are generally caused by residential and/or commercial development made possible by the project.

Examples of indirect impacts include undirected growth including additional traffic, over-extended police and fire protection, or heavy financial burden on existing and future residents for the cost of the drinking water

system facilities. It is not expected that the proposed project would cause any significant undirected growth that would result in changes to zoning, population density, or types of developments found throughout Standish Township, including residential, commercial and industrial areas.

Transportation and infrastructure is already in place within the service area, and the proposed project will only serve to enhance the existing infrastructure.

The proposed project will not result in any changes in anticipated land use.

There are no anticipated indirect impacts due to changes to the natural setting or sensitive ecosystems or jeopardy to any endangered species resulting from potential secondary growth.

There are no anticipated changes in air or water quality stemming from any primary or potential secondary development as a result of the improvements since any additional commercial/industrial development would be subject to the individual communities' existing zoning requirements.

No impacts on the aesthetic of the area are anticipated. Impacts resulting from the resource consumption over the life of the project are not anticipated.

6.4 CUMULATIVE IMPACTS

There are no anticipated cumulative impacts that would increase in magnitude over time or result from individually minor, but collectively significant actions of the project.

7.0 MITIGATION OF IMPACTS

7.1 GENERAL

Structural and non-structural measures that avoid, eliminate, or mitigate adverse impacts on the environment need to be identified in the project plan. Structural measures involve the specific design and construction of the improvements, while non-structural measures involve regulatory, institutional, governmental, or private plans, policies, or regulations of the Township. Mitigation of short-term, long-term, and indirect impacts must be considered in the project plan.

7.2 SHORT-TERM IMPACT MITIGATION

7.2.1 Traffic and Safety Hazard Control

Because construction work will be limited to road ROW's, it is anticipated that traffic control measures will be required. Traffic control and maintaining access to homes and businesses will be the responsibility of the Contractor. However, access to all homes and businesses will be maintained and emergency vehicle access will be ensured throughout construction. Residents will be notified when construction work is scheduled in their area. Traffic detour signs and flag control will be incorporated to provide non-local traffic with the information they need to navigate the construction site and to travel safely.

Construction site safety is the responsibility of the contractor. The contractor will be required to have only trained persons performing all phases of the work. The contractor will also be required to comply with the Occupational Safety & Health Act (OSHA), including using back up alarms on all equipment, having employees trained in hazard control, and maintaining materials safety data sheets (MSDS) for materials that may be used or handled by construction personnel.

7.2.2 Dust Control

Construction activities will result in increased dust in the vicinity of the construction sites during the length of the proposed construction. Mitigation measures to minimize the negative effect of dust on residents and construction workers will be defined in the project specifications. It is anticipated that dust control will be provided by the application of water and/or dust palliative during dry and dusty periods. The Contractor will be required to control dust in accordance with methods described in the project specifications.

7.2.3 Noise Control

Noise levels will increase temporarily during construction of the proposed project. Construction activities will only be allowed during the hours approved by the Township and would be subject to all local noise control ordinances. Construction workers and site visitors may be required to wear earplugs to minimize the effects of long-term noise during the construction operations.

7.2.4 Soil Erosion/Sedimentation Control

The Contractor will be required to obtain a soil erosion and sedimentation control permit from the local agency prior to the start of the work. It is anticipated that utilized mitigation measures may include silt fence, straw bales, rip rap, geotextile fabric, and other such methods, as appropriate.

7.2.5 Tree Protection

There will be no impact to trees as we are using trenchless technology directionally drilling methods.

7.2.6 Disposal of Construction Spoils

Disposal of construction spoils will be at an approved upland location and any contaminated soils will be taken to a licensed landfill facility.

7.2.7 Restoration of Disturbed Areas

Construction will generally be confined to within road right-of-ways. Disturbed areas will be restored in a timely fashion and in accordance with the project specifications.

7.2.8 Water System Operational Impacts

While they are being constructed, new watermains will be disconnected from existing ones. However, when new watermains get connected to the existing system, small, localized areas of the existing system may need to be temporarily shut off as part of flushing out the new mains of sediment and other materials that should not be in domestic water supply.

7.3 MITIGATION OF LONG-TERM IMPACTS

7.3.1 General Construction

Mitigation measures would be developed to ensure that sensitive environments do not suffer permanent damage. Every effort will be made to avoid potential long-term or irreversible adverse impacts during the construction of the drinking water system improvements.

The construction work will incorporate “best management practice” methods for installing pipelines or disturbing the earth. Wetland, floodplain, and inland stream mitigation would be handled through the permit process. If impacts cannot be avoided, wetland mitigation measures will be used, although this is not anticipated as part of this Project. The design and project specifications will include the proper use of physical measures to reduce soil erosion to a manageable level and any disturbed slope areas will be immediately seeded, mulched and/or sodded to prevent soil erosion and/or sedimentation.

7.3.2 Site and Routing Decisions

The proposed watermain route to connect to the City of Pinconning’s existing system will have no major impact on the existing environment.

7.3.3 Operational Impacts

There are no anticipated changes in operational impacts to the environment.

7.4 MITIGATION OF INDIRECT IMPACTS

7.4.1 Master Plan and Zoning

The most effective way of mitigating unrestricted growth in any community is proactive creation of zoning districts and effective enforcement of that zoning. It is anticipated that 15% growth could occur, however, unrestricted growth in these areas is not anticipated with or without the proposed project.

7.4.2 Ordinances

In the event that growth in the community occurs, future action will be taken in order to minimize potential increases in stormwater generated from the new construction.

Increased noise, odors, air pollution and general combustion sources will also be addressed if future growth happens from the proposed project.

7.4.3 Staging Construction

It is not anticipated that this project will need to be broken into multiple stages/segments. The White’s Beach area is currently without municipal water so staging construction is not feasible.

7.5 LONG-TERM IMPACT MITIGATION

Mitigation measures would be developed to ensure that sensitive environments do not suffer permanent damage. Every effort will be made to avoid potential long-term or irreversible adverse impacts during the construction of the water distribution system improvements. Watermain construction work will incorporate “best management practice” methods for installing pipelines and disturbing the earth.

Wetland, floodplain, and inland stream mitigation would be handled through the permit process. Although wetland, floodplain, inland stream, and other water resource impacts are not anticipated as part of this project, mitigation measures will be employed if these impacts cannot be avoided and/or the need for them arises.

The design and project specifications will include the proper use of physical measures to reduce soil erosion to a manageable level. Any disturbed slope areas will be immediately seeded, mulched, and/or sodded to prevent soil erosion and/or sedimentation.

7.6 INDIRECT IMPACT MITIGATION

The most effective way of mitigating unrestricted growth in any community is proactive creation of zoning districts and effective enforcement of that zoning. Unrestricted growth in the Township water distribution system service area is not anticipated, with or without the proposed project.

8.0 PUBLIC PARTICIPATION

8.1 PUBLIC MEETINGS ON PROJECT ALTERNATIVES

A Public Hearing for the DWSRF Project Plan was held April 18th, 2023 to discuss the need for the project, principal alternatives, environmental impacts, description of the Recommended Alternative and associated cost estimates and user charge, and schedule of the proposed project. A copy of the public notice, public hearing transcript, presentation and resolution is included in Appendix D.

8.2 FORMAL PUBLIC HEARING

A formal public hearing on project alternatives and user costs was held on April 18th, 2023 at 5:00 pm at the Standish Township Hall.

8.2.1 Public Hearing Advertisement

The public hearing was advertised on the Township website. A copy of the public hearing notice is included in Appendix D.

A copy of the Draft Project Plan was made available to the public for a 10-day period at the Standish Township Hall and on the Township's website as stated in the public hearing notice.

8.2.2 Public Hearing Transcript

An audio transcript of the public hearing is included in Appendix D of the Final Project Plan.

8.2.3 Public Hearing Contents

The following items were discussed at the public hearing:

- Project background.
- A description of the drinking water treatment needs and problem areas.
- A description of the principal alternatives considered.
- Proposed method of financing.
- Comparison of environmental impacts for the principal alternatives.
- Recommended Alternative.
- Proposed monthly user costs for the implementation of the Recommended Alternative for the average residential customer.
- Proposed timeline schedule.
- Estimate of project cost for the selected alternative.

8.2.4 Comments Received and Answered

No written comments from the public were received before, during or subsequent to the Public Hearing. Questions and comments received during the Public Hearing were addressed as a part of the Question and Answer portion of the presentation.

8.2.5 Adoption of the Project Plan

The official period for receiving comments was ended at the close of the formal public hearing. After the close of the public comment period, the Recommended Alternative was selected for implementation by the Standish Township Board. A copy of the Township's resolution to adopt the Project Plan and to implement the selected alternative is included in Appendix D.

APPENDIX A

OPINION OF PROBABLE COSTS – SELECTED ALTERNATIVE

Standish Township
 DWSRF Water Improvements
 Whites Beach to City of Pinconning

DWSRF
 FY2024
 5/1/2023



Item #	Description	Construction Cost
1	6 inch Water Main	\$4,140,000
2	Ground Storage Tank and Booster Pumps	\$550,000
3	Railroad crossing	\$66,000
4	Valves	\$137,500
5	Fire Hydrant Assembly	\$334,800
6	Fittings/Connections	\$64,000
7	Master Meter Pit	\$165,000
8	Drive/Road Replacement	\$50,000
9	Construction Contingencies	\$525,758
	Construction Total	\$6,033,058
	Engineering, Administration, Legal:	\$1,266,942
	Estimated Project Cost	\$7,300,000

APPENDIX B

AGENCY/ENVIRONMENTAL REVIEW CORRESPONDENCE



Central Michigan District Health Department

Promoting Healthy Families, Healthy Communities



Robert W. Graham, D.O., MPH
Medical Director

Steve Hall, RS, MS
Health Officer

Main Office
2012 E. Preston Ave.
Mt. Pleasant, MI 48858
Administration 989-773-5921
FAX: 989-773-4319

Branch Offices:

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Standish, MI 48658
989-846-6541
FAX: 989-846-0431

Clare County
225 W. Main St.
Harrison, MI 48625
P.O. Box 237
989-539-6731
FAX: 989-539-4449

Gladwin County
103 N. Bowery
Gladwin, MI 48624
989-426-9431
FAX: 989-426-6952

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FAX: 989-773-4319

Osceola County
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Reed City, MI 49677
231-832-5532
FAX: 231-832-1020

Marion Human Services
107 E. Main St.
P.O. Box 39
Marion, MI 49665
231-743-9877
FAX: 231-743-2140

Roscommon County
1015 Short Drive
P.O. Box 739
Prudenville, MI 48651
989-366-9166
FAX: 989-366-8921

February 23, 2015

Ms. Wanda Dziwura – Area Specialist
Rural Development
U.S. Department of Agriculture
1147 N. Pine Rd.
Essexville, MI 48732

Re: Whites Beach Septic Systems

Dear Ms. Dziwura:

As you may already know, the Central Michigan District Health Department received a Great Lakes Restoration Initiative Grant to evaluate the reasons for the numerous beach closings due to high levels of E.coli bacteria at beaches along the Arenac County shoreline. Our work plan included evaluating individual septic systems and water supplies as possible contributors to the high levels of bacteria in the water.

In Standish Township, specifically Whites Beach and the Point Wenona Subdivision, extremely poor site conditions exist for on-site wastewater disposal. The lots are small, the ground water table is high and the soils have very poor permeability (clay soils). Also, unless there is more than one lot combined as a parcel, it is impossible to achieve the required isolation between drinking water supplies and septic systems.

We evaluated in excess of 250 properties in the Whites Beach area. The data confirms that far greater than 50% of the individual septic systems do not meet current standards, either due to isolation from drinking water supplies, substandard construction or currently in a state of failure allowing sewage to reach the ground surface. Furthermore, our study showed a direct connection of storm water runoff contaminated with high levels of E.coli bacteria in the road ditches which empties directly into the Saginaw Bay.

As a result of our findings, the Central Michigan District Health Department has decided to stop issuing permits for replacement/repair of existing systems unless there are conditions present which meet the minimum requirements of our Sanitary Code. It is our opinion that a community sewer system is the only solution. With the proximity of an existing sewer treatment plant, this is the most logical long term solution. Thank you for the opportunity to support this project and we look forward to working with you.

Please visit us at our website www.cmdhd.org



Central Michigan District Health Department

Promoting Healthy Families, Healthy Communities



Robert W. Graham, D.O., MPH
Medical Director

Steve Hall, RS, MS
Health Officer

Main Office
2012 E. Preston Ave.
Mt. Pleasant, MI 48858
Administration 989-773-5921
FAX: 989-773-4319

Sincerely,

Doug Fitzgerald, RS
Environmental Health Supervisor
Arenac County Branch Office
Central Michigan District Health Department

CC: Michelle Patton, RS –Director of Environmental Health Services, CMDHD
Robert North, Standish Township Supervisor
Chris Townley, PE, Townley Engineering

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APPENDIX C

OVERBURDENED COMMUNITY STATUS DETERMINATION



MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
**OVERBURDENED AND SIGNIFICANTLY OVERBURDENED COMMUNITY STATUS
DETERMINATION WORKSHEET**

The following data is required from each State Revolving Fund (SRF) applicant requesting a determination for overburdened and significantly overburdened community status.

The most recent census and tax data are available in a searchable table on EGLE's [State Revolving Fund – Overburdened Community Definition and Scoring Criteria Development](#) webpage along with an excel worksheet to help determine blended Median Annual Household Income (MAHI) and blended taxable value per capita for regional systems. The MAHI and taxable value per capita table will be used to make all FY24 determinations. Applicants are encouraged to visit this page prior to completing this form to see if they qualify based on MAHI (blended MAHI if applicable) or taxable value per capita (blended taxable value per capita if applicable) alone. If so, they only need to fill out lines 1 and 2 of this form, electronically sign it on page 2, and submit.

Alternately, if the applicant's MAHI or blended MAHI is above the state average - \$63,498 for FY24 – they cannot be determined as being overburdened or significantly overburdened for FY24 funding and should not complete or turn in this form.

For applicants whose MAHI or blended MAHI is below \$63,498 but do not automatically qualify based on MAHI or taxable value per capita alone, please complete the entire form and return to:

Mark Conradi
conradim@michigan.gov

Name of Applicant

Please check the box indicating which funding source this determination is for:

DWSRF

CWSRF

1. Is this a regional system? A regional system refers to any system that serves more than one municipality (cities, townships, and/or villages)

Yes

No

If yes, refer to the instructions at the end of this form to complete calculations for a blended MAHI and blended taxable value per capita. Additionally, page 3 of this form will also need to be completed.

2. Median Annual Household Income from table on the overburdened webpage (blended if applicable)

3. Taxable Value Per Capita from table on the overburdened webpage (blended if applicable)

4. Total amount of anticipated debt for the proposed project (amount of loan requested for FY24 loan)

5. Annual payments on the existing debt for the system

6. Total operation, maintenance, and replacement expenses (OM&R) for the system on an annual basis

7. Number of residential equivalent users (REUs) in the system

***I (_____) hereby certify that the information in this form is complete, true, and correct to the best of my knowledge.**



5/4/2023

Signature

Date

For determinations made using anticipated debt, a final determination will be made based upon the awarded loan amount and not the anticipated amount provided on this form.

APPENDIX D

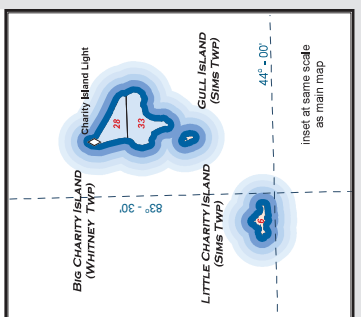
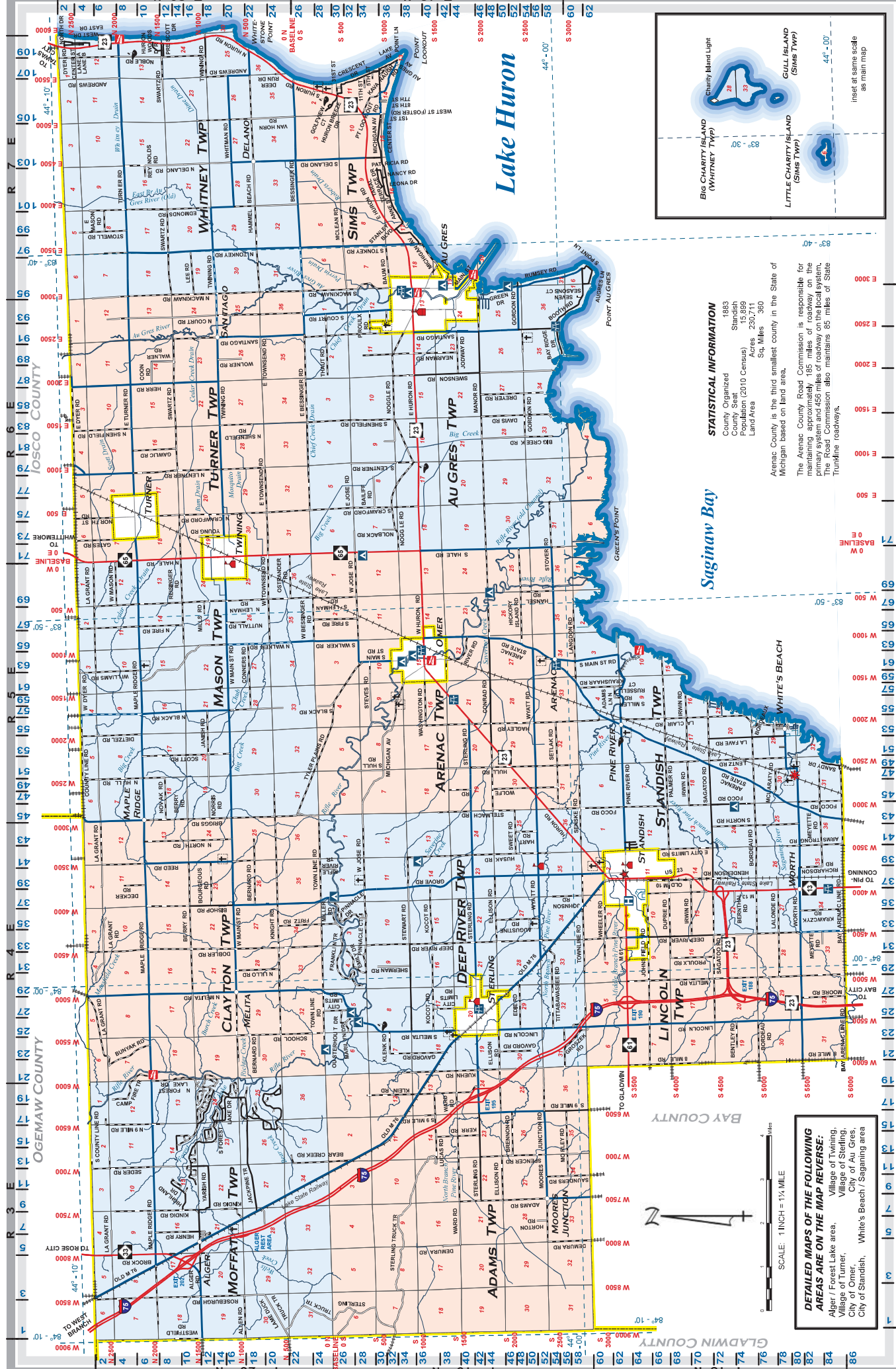
PUBLIC PARTICIPATION

- **MEETING MINUTES**
- **PROOF OF PUBLICATION**
- **PUBLIC HEARING NOTICE**
- **PUBLIC ATTENDING THE HEARING**
- **PUBLIC HEARING PRESENTATION**
- **RESOLUTION OF PLAN ADOPTION**
- **PUBLIC HEARING RECORDING**
(UNDER SEPARATE ENCLOSURE)

APPENDIX E

MAPS

- **ARENAC COUNTY**
- **PROPOSED IMPROVEMENT OPTIONS**
 - **USFWS WETLANDS**
 - **FEMA FLOODPLAIN**
 - **USGS QUADRANGLE**
- **1982 QUATERNARY GEOLOGY OF MICHIGAN**
- **1987 BEDROCK GEOLOGY OF MICHIGAN**
 - **USDA SOILS CLASSIFICATION**
 - **USDA FARMLAND CLASSIFICATION**
 - **STANDISH TOWNSHIP ZONING**
- **STANDISH TOWNSHIP FUTURE LAND USE**
- **ARENAC & BAY COUNTY COASTAL ZONE MANAGEMENT AREA**



STATISTICAL INFORMATION
 County Organized 1883
 County Seat Standish
 Population (2010 Census) 15,999
 Area 230.360 Sq. Miles

Arenac County is the third smallest county in the State of Michigan based on land area.
 The Arenac County Road Commission is responsible for maintaining approximately 185 miles of roadway on the primary system and 456 miles of roadway on the local system. The Road Commission also maintains 85 miles of State Thruhine roadways.

GENERAL HIGHWAY MAP OF ARENAC COUNTY, MICHIGAN

ISSUED BY ARENAC COUNTY BOARD OF ROAD COMMISSIONERS

MAP LEGEND

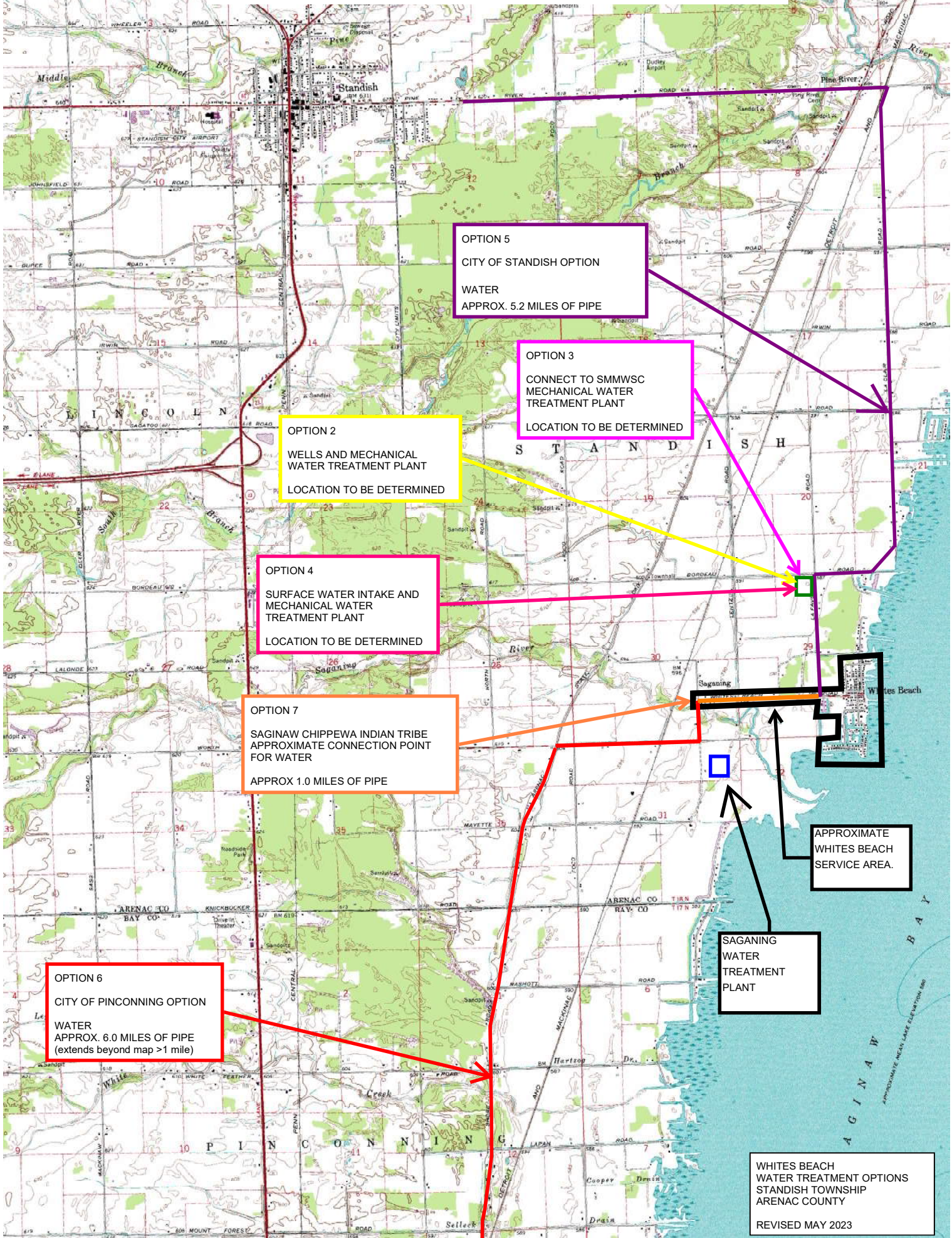
	Paved		Gravel		Unimproved
	Interstate Highway		Federal Highway		State Highway
	County Primary		County Local		Adjacent County Maintained
	City/Gladwin		Railroads		Water Features
	Townships		Settlements		Latitude / Longitude
	Courthouse		Hospital		Park
	Eagle's Landing Casino		School		Road Indexing Grid Numbers
	2500 Addressing System		Campground		DNRE Fishing Access
	Lighthouse		Cemetery		Golf Course
	Fairgrounds				

DETAILED MAPS OF THE FOLLOWING AREAS ARE ON THE MAP REVERSE:
 Village of Twining,
 Village of Forest Lake area,
 Village of Steffing,
 City of Au Gres,
 City of Standish,
 White's Beach / Saginaw area



Michigan's Official Road Map Provider
 8225 E. Wacker Drive
 Bay City, MI 49709
 989-761-1100
 www.bacenterprises.com

Proposed Improvement Options



OPTION 5
CITY OF STANDISH OPTION
WATER
APPROX. 5.2 MILES OF PIPE

OPTION 3
CONNECT TO SMMWSC
MECHANICAL WATER
TREATMENT PLANT
LOCATION TO BE DETERMINED

OPTION 2
WELLS AND MECHANICAL
WATER TREATMENT PLANT
LOCATION TO BE DETERMINED

OPTION 4
SURFACE WATER INTAKE AND
MECHANICAL WATER
TREATMENT PLANT
LOCATION TO BE DETERMINED

OPTION 7
SAGINAW CHIPPEWA INDIAN TRIBE
APPROXIMATE CONNECTION POINT
FOR WATER
APPROX 1.0 MILES OF PIPE

OPTION 6
CITY OF PINCONNING OPTION
WATER
APPROX. 6.0 MILES OF PIPE
(extends beyond map >1 mile)

APPROXIMATE WHITES BEACH
SERVICE AREA.

SAGINAW
WATER
TREATMENT
PLANT

WHITES BEACH
WATER TREATMENT OPTIONS
STANDISH TOWNSHIP
ARENAC COUNTY
REVISED MAY 2023

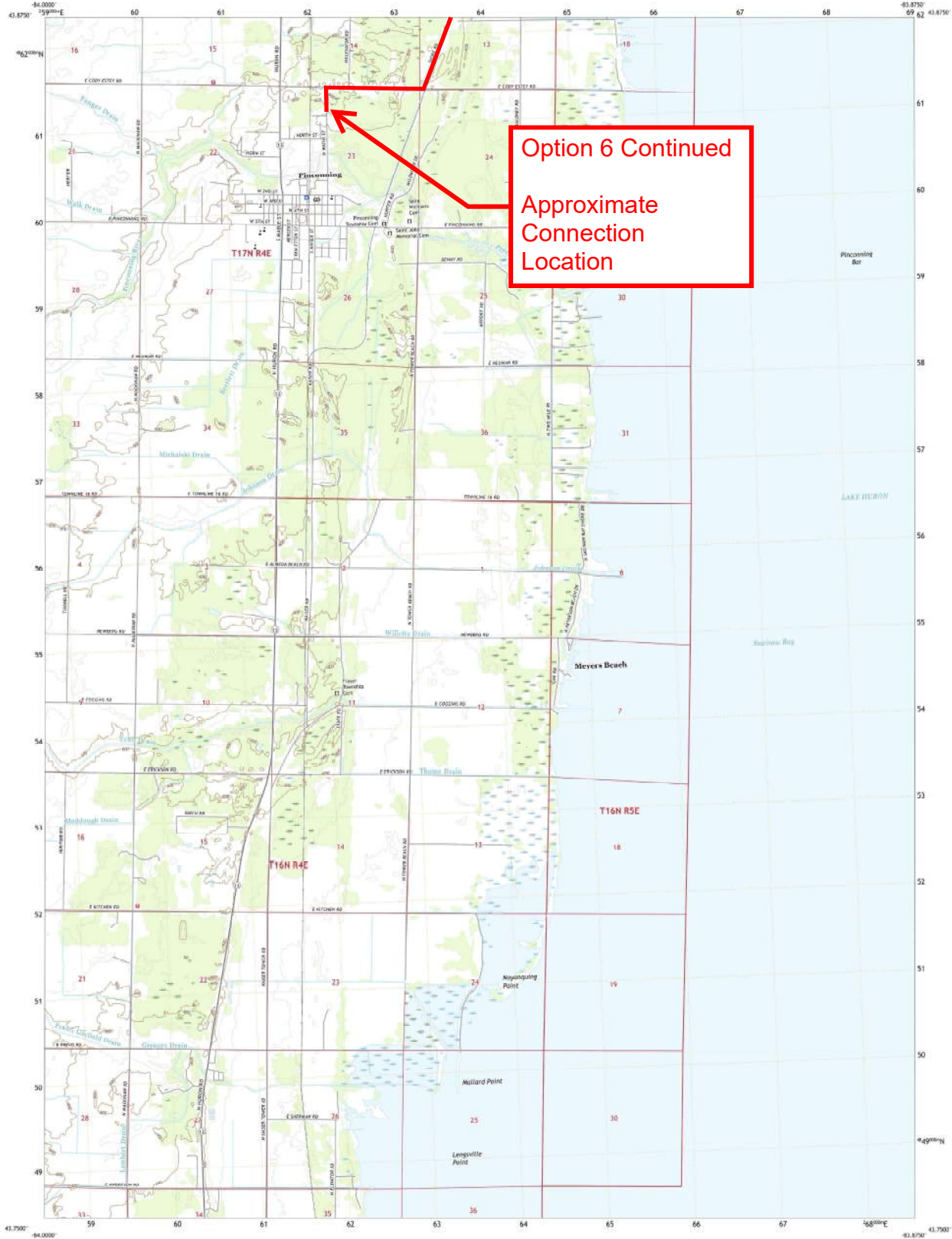
Proposed Improvement Options



U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

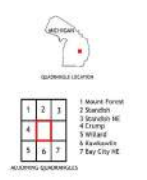
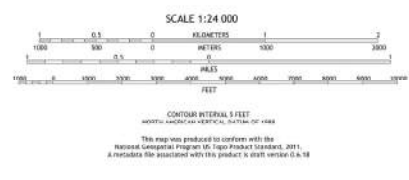


PINCONNING QUADRANGLE
MICHIGAN - BAY COUNTY
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projections and
1:100,000-meter grid/Elevation Transformation: NAD83 to WGS84
This map is not a legal document. Boundaries may be
generalized for this map scale. Private lands with government
recreational may not be shown. Obtain permission before
entering private lands.

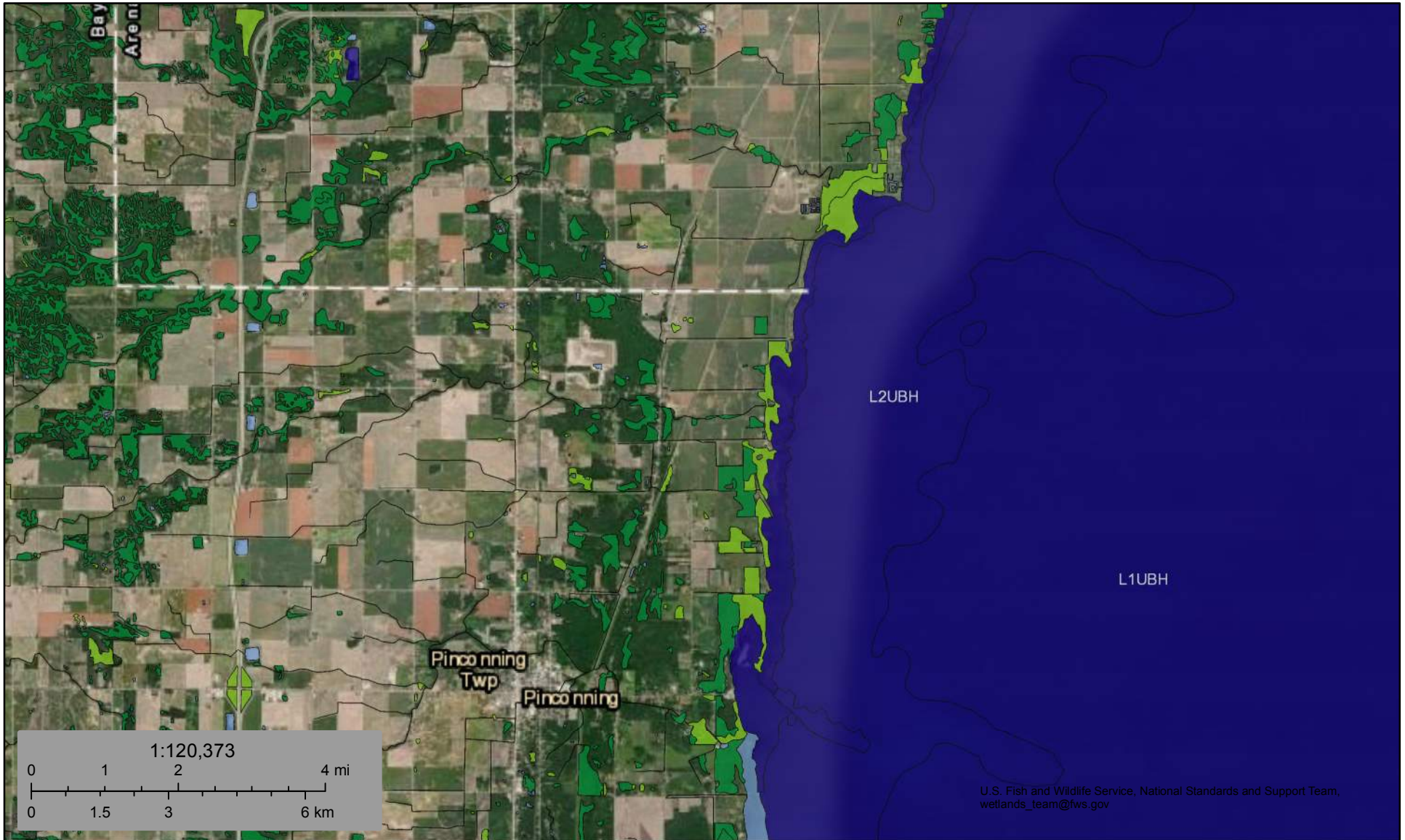
Imagery: USGS, July 2016 - October 2016
Roads: ESRI, Census Bureau, 2016
Names: ESRI, 2016
Hydrography: National Hydrography Dataset, 2016
Contours: National Elevation Dataset, 2016
Elevation: SRTM30 PLUS, 2016
Public Land Survey System: BLM, 2016
National: FWS, National Wetlands Inventory, 2000



ROAD CLASSIFICATION

Expressway	Local Connector
Secondary Hwy	Local Road
Route	4WD
Interstate Route	US Route
	State Route





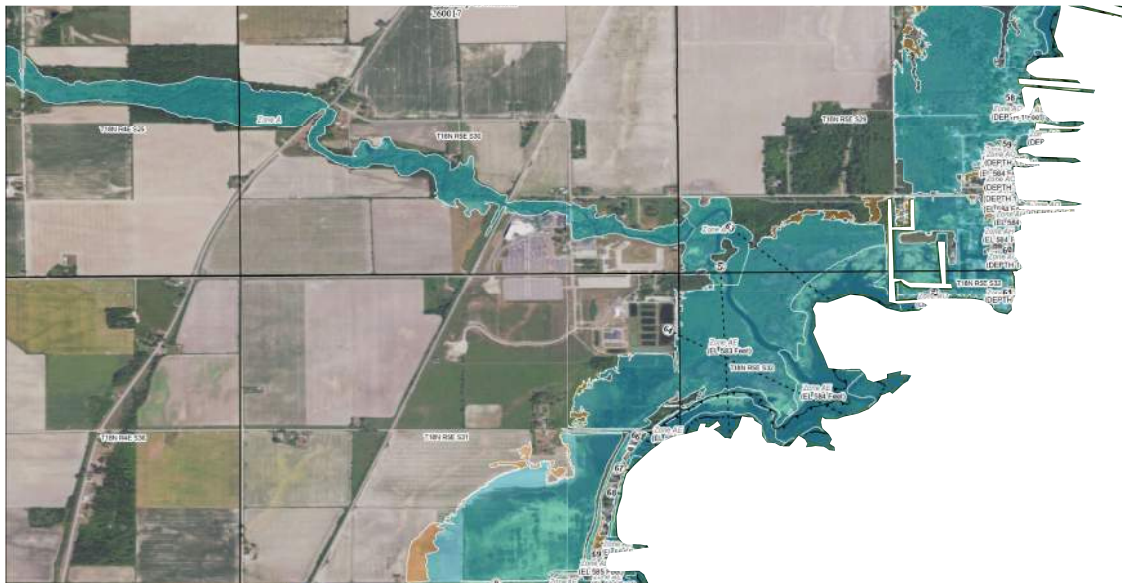
U.S. Fish and Wildlife Service, National Standards and Support Team, wetlands_team@fws.gov

March 16, 2023

Wetlands

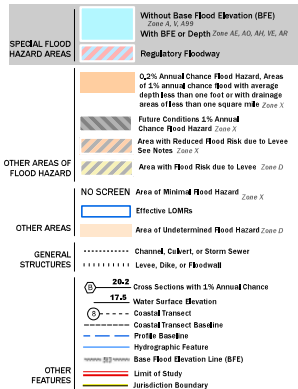
- Estuarine and Marine Deepwater
- Freshwater Forested/Shrub Wetland
- Lake
- Freshwater Emergent Wetland
- Freshwater Pond
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT FIRM PANEL LAYOUT



NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, and/or other products, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-368-6277) or visit the FEMA Flood Map Service Center website at <https://www.fema.gov>. Available products may include previously issued letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities shown on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

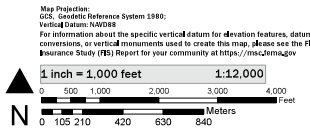
To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-433-6243.

Base map information shown on this FIRM was provided in digital format by the United States Geological Survey (USGS). The base map shown is the USGS National Map, Orthorectified, last refreshed October, 2010.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on 3/16/2023 11:22 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at <https://www.fema.gov/media-library/assets/documents/15418>.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The base map shown complies with FEMA's base map accuracy standards. This map complies with the one-meter accuracy standard for the use of digital flood maps if it is not void as described below. The base map shown complies with FEMA's base map accuracy standards. The effects of wave hazards between Zone VE and the LHMMA or between the LHMMA and the LHMMA for areas where Zone VE is not identified will be similar to, but less severe than, those in Zone VE.

SCALE



NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

PANEL 395 of 435

Panel Contains:

COMMUNITY	NUMBER	PANEL
TOWNSHIP OF PRECINCTING	280023	0395
TOWNSHIP OF STANDISH	280017	0395

FEMA
National Flood Insurance Program

MAP NUMBER
26011C0395E
EFFECTIVE DATE
June 15, 2022

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood information.

To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **Highways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies the FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only to standard of 0.0 North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the Floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was Universal Transverse Mercator (UTM) zone 16. The horizontal datum was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NGS512
National Geodetic Survey
SSM3-3, #6002
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov>.

Base Map information shown on this FIRM was provided in digital format by Bay County, Michigan. This information was photogrammetrically compiled at a scale of 1:200 from aerial photography dated 2005.

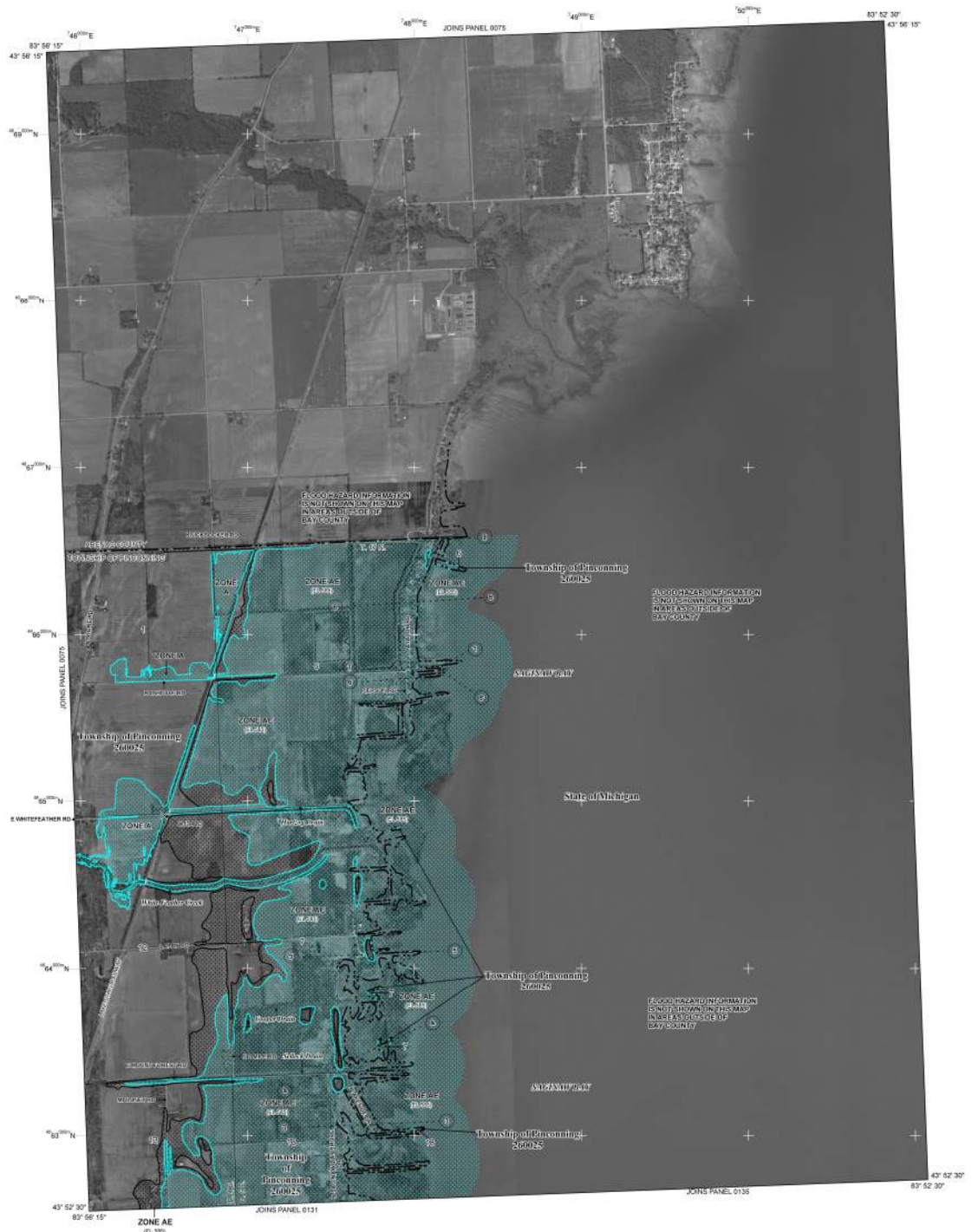
The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the profile baselines, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or dis-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels, community map repository addresses, and a Listing of Communities table containing National Flood Insurance Program rates for each community as well as a listing of the panels in which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at <http://www.fema.gov>.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA-MAP (1-877-326-2627) or visit the FEMA website at <http://www.fema.gov/business/fip/>.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHA) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD
The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equalled or exceeded in any given year. The base flood elevation is the elevation of the area subject to flooding by the 1% annual chance flood. Areas of Special Flood-Hazard include Zones A, AE, AH, AO, AR, AV, and V. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponds); Base Flood Elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow or rising terrain); average depths determined; for areas of sheet flow, depths are determined.
- ZONE AR** Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently destroyed. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE AV** Areas to be protected from the 1% annual chance flood by a federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE
The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment to the 1% annual chance flood. It can result without substantial increases in flood heights.

- OTHER FLOOD AREAS**
- ZONE X** Areas of 0.2% annual chance flood, areas of 0.1% annual chance flood with average depths of less than 1 foot or with changing areas less than 1 square mile, and areas protected by levees from the 1% annual chance flood.
- OTHER AREAS**
- ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE B** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS
Areas in which flood hazards are undetermined, but possible.

OTHERWISE PROTECTED AREAS (OPAs)
OPAs areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

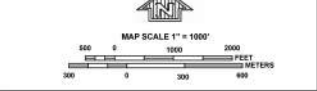
- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway Boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary defining Special Flood Hazard Area zones and boundary defining Special Flood Hazard Areas of different Special Flood Elevations, flood depths, or flood velocities
- Base Flood Elevation (in feet and vertical, elevation in feet)
- Base Flood Elevation value where uniform within zone; elevation in feet

- Referenced to the North American Vertical Datum of 1988
- Cross section line
- Transit line
- 43° 52' 00" 83° 52' 15" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) datum-reference
- 1000-meter Universal Transverse Mercator grid values, zone 16
- XXXXXX X Bench mark (see explanation in Notes to Users section of the FIS report)
- 61.5 River gage
- MAP REPOSITORIES
- Refer to Map Repositories for a Map Index
- EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP: June 18, 1999
- EFFECTIVE DATES OF REVISIONS TO THIS PANEL:

September 17, 2010 - to add Special Flood Hazard Areas and roads and road names, to change Special Flood Hazard Areas, to update corporate limits and map format, to incorporate previously issued Letters of Map Revision, and to reflect updated geographic information.

The community map repository history prior to countywide mapping, refer to the Community Map Repository table located in the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-358-9620.



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0070E

FIRM
FLOOD INSURANCE RATE MAP
BAY COUNTY, MICHIGAN
ALL JURISDICTIONS

PANEL 70 OF 460
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

COMMUNITY	NUMBER	PANEL	SUFFIX
TOWNSHIP OF	26010	0070	E

Notice to User: The **Map Number** shown below should be used when placing map orders, the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 26010C0070E
MAP REVISED SEPTEMBER 17, 2010
Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **footprints** have been determined, users are encouraged to consult the Flood Profiles and Footprint Data and/or Summary of Elevation Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies the FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only (standard of 0.0 North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also presented in the Summary of Elevation Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Elevation Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **footways** were computed at cross sections and interpolated between cross sections. The footways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Footway widths and other pertinent footway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was Universal Transverse Mercator (UTM) zone 16. The horizontal datum was NAD 83 GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov>, or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NINGS-12
National Geodetic Survey
SSM-C-3, #6002
1315 East-West Highway
Silver Spring, Maryland 20910-3202
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov>.

Base Map information shown on this FIRM was provided in digital format by Bay County, Michigan. This information was photogrammetrically compiled at a scale of 1:200 from aerial photography dated 2005.

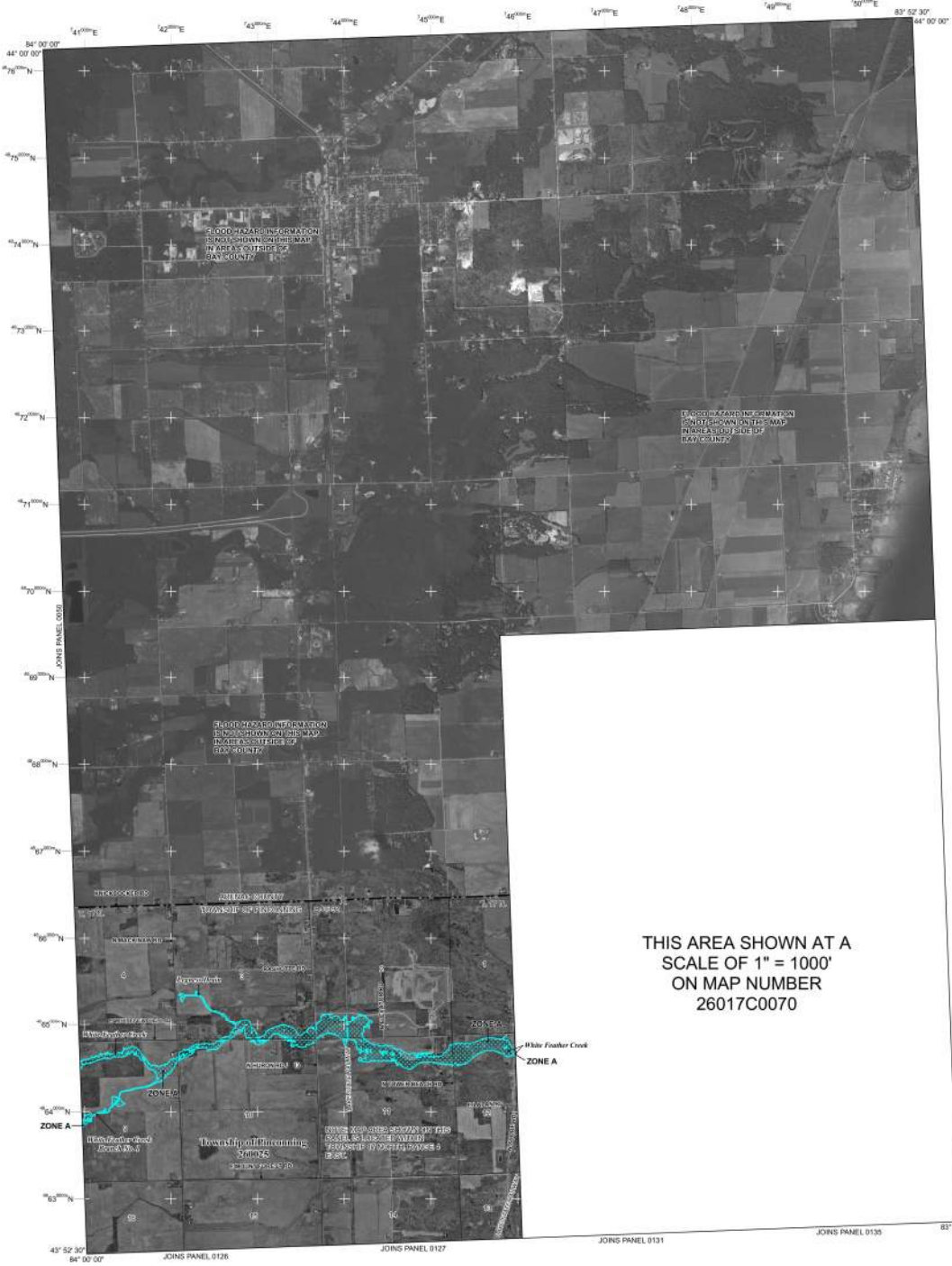
The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baselines**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or disannexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

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If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-366-2827) or visit the FEMA website at <http://www.fema.gov/business/fip/>.



THIS AREA SHOWN AT A SCALE OF 1" = 1000' ON MAP NUMBER 26017C0070

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHA) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood, also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The annual chance flood is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AV, V, VE, and V1. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.
ZONE AE Base Flood Elevations determined.
ZONE AH Flood depths of 1 to 3 feet (usually above flow or rising terrain); average depths determined for areas of elevated flow, which may be determined.
ZONE AO Flood depths of 1 to 3 feet (usually above flow or rising terrain); average depths determined for areas of elevated flow, which may be determined.
ZONE AV Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently abandoned. Zone AV indicates that the former flood control system is being retained to provide protection from the 1% annual chance or greater flood.
ZONE AVB Area to be protected from the 1% annual chance flood by a flood control protection system under construction; no Base Flood Elevations determined.
ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood, areas of 1% annual chance flood with average depths of less than 1 foot, or with drainage areas less than 1 square mile, and areas protected by levees from the 1% annual chance flood.
OTHER AREAS
ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

OPAs areas and OPAs are normally isolated wetlands or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary
 0.2% Annual Chance Floodplain Boundary
 Floodway Boundary
 Zone D Boundary
 CBRS and OPA Boundary
 Boundary defining Special Flood Hazard Area Zones and boundary defining Special Flood Hazard Areas of different Special Flood Hazard Areas, flood depths, or flood velocities.
 Base Flood Elevation line and vertical elevation in feet
 Base Flood Elevation value where station within zone; elevation in feet

Referenced to the North American Vertical Datum of 1988

Close section line
 Transit line
 Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) meters referenced
 1000 meter Universal Transverse Mercator grid values, zone 16
 Bench mark (see explanation in Notes to Users section of the FISR panel)
 River file

MAP REPOSITORIES
 Refer to Map Repositories for on map index
APPROXIMATE MAPS OF COMMUNITARIAN FLOOD INSURANCE RATE MAP
 JUNE 18, 1988

EFFECTIVE DATES OF REVISIONS TO THIS PANEL

September 17, 2010 - to add Special Flood Hazard Areas and roads and road names to change Special Flood Hazard Areas, to update corporate limits and map format, to incorporate previously issued Letters of Map Revision, and to reflect latest topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in the community, contact your insurance agent or call the National Flood Insurance Program (800-435-8833).

MAP SCALE 1" = 2000'

1000 0 2000 4000
 400 0 800 1600
 FEET
 METERS

NFIP

PANEL 0075E

FIRM
FLOOD INSURANCE RATE MAP
BAY COUNTY, MICHIGAN
ALL JURISDICTIONS

PANEL 76 OF 450
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	DATE	STATUS
TOWNSHIP OF			

Notice to User: The **Map Number** shown below should be used when placing map orders, the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
26017C0075E
MAP REVISED
SEPTEMBER 17, 2010

Federal Emergency Management Agency

NOTES TO USERS

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Boundaries of the **Flowways** were computed at cross sections and interpolated between cross sections. The flowways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Flowway widths and other pertinent flowway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was Universal Transverse Mercator (UTM) zone 16. The horizontal datum was NAD 83 (GRS 1980) spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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NGS Information Services
NOAA, NIMS-12
National Geodetic Survey
SSM-C-3, #6002
1315 East-West Highway
Silver Spring, Maryland 20910-3082
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov>.

Base Map information shown on this FIRM was provided in digital format by Bay County, Michigan. This information was photogrammetrically compiled at a scale of 1:200 from aerial photography dated 2005.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baselines**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best date available at the time of publication. Because changes due to annexations or disannexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate line locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels, community map repository addresses, and a Listing of Communities table containing National Flood Insurance Program status for each community as well as a listing of the panels in which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-400-358-9600 and its website at <http://www.fema.gov/business/firm>.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/business/firm>.



LEGEND

- SPECIAL FLOOD HAZARD AREAS (SFHA) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**
- The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. Areas of Special Flood Hazard include Zone A, AE, AH, AO, AV, V, VE, VE1, and VE2. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.
- ZONE A** No Base Flood Elevations determined.
 - ZONE AE** Base Flood Elevations determined.
 - ZONE AH** Flood depths of 1 to 3 feet (usually sheet flow or rising tides); average depths determined for areas of sheet flow flooding, which are also determined.
 - ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow or rising tides); average depths determined for areas of sheet flow flooding, which are also determined.
 - ZONE AV** Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently described. Zone AV indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
 - ZONE AVB** Area has been protected from the 1% annual chance flood by a floodway flood protection system under construction; no Base Flood Elevations determined.
 - ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
 - ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
- FLOODWAY AREAS IN ZONE AE**
- The flowway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.
- OTHER FLOOD AREAS**
- ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot and with drainage areas less than 1 square mile; and areas protected by levees from the 1% annual chance flood.
 - OTHER AREAS** Areas determined to be outside the 0.2% annual chance floodplain. Areas in which flood hazards are undetermined, but possible.
- COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
- OTHERWISE PROTECTED AREAS (OPAs)**
- CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas:
- 1% Annual Chance Floodplain Boundary
 - 0.2% Annual Chance Floodplain Boundary
 - Floodway boundary
 - Zone B boundary
 - CBRS and OPA boundary
- Boundary defining Special Flood Hazard Area Zones and boundary defining Special Flood Hazard Areas of different Special Flood Hazard Areas, Flood depths, or flood velocities.
- Base Flood Elevation line and vertical elevation in feet
- Base Flood Elevation value where station within zone; elevation in feet
- Reference to the North American Vertical Datum of 1988
- Close section line
 - Traverse line
 - Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) (meter resolution)
 - 1000-meter Universal Transverse Mercator grid values, zone 16
 - North mark (see explanation in Notes to Users section of the FIS Report)
 - Water flow
- MAP REPOSITORIES**
- Refer to Map Repositories for on Map Index
- APPROXIMATE DATE OF COMMUNITY FLOOD INSURANCE RATE MAP**
June 18, 1999
- EFFECTIVE DATES OF REVISIONS TO THIS PANEL**



NFIP

PANEL 0127E

FIRM

FLOOD INSURANCE RATE MAP

BAY COUNTY, MICHIGAN

ALL JURISDICTIONS

PANEL 127 OF 450
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

COMMUNITY	NUMBER	PANEL	STATUS
PREVIOUSLY	0127E	0127E	II
PREVIOUSLY	30000	0127E	II
TOWNSHIP			

Notice to User: The **Map Number** shown below should be used when placing map orders. The **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
26017C0127E

MAP REVISED
SEPTEMBER 17, 2010

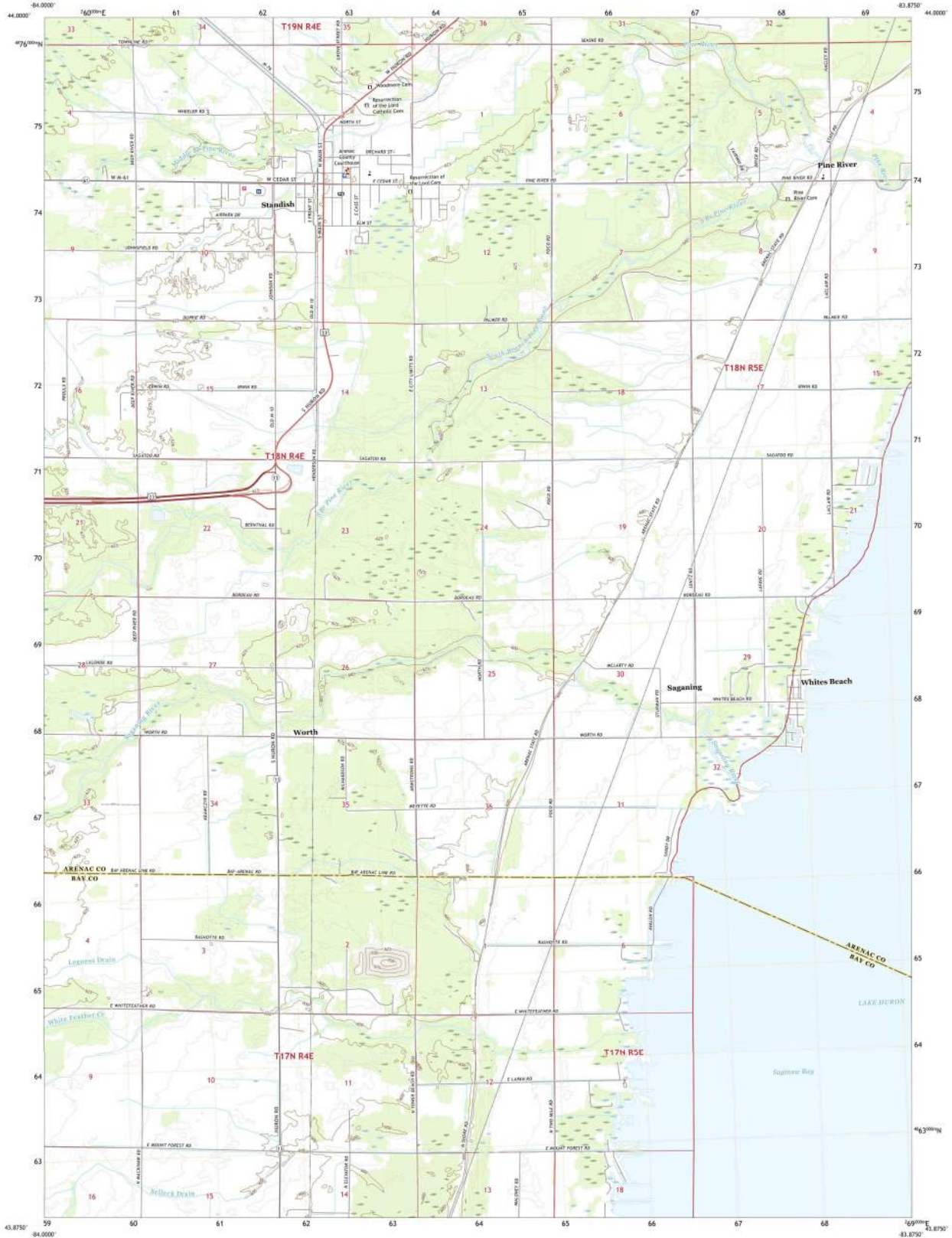
Federal Emergency Management Agency



U.S. DEPARTMENT OF THE
U.S. GEOLOGICAL SURVEY

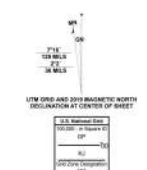
USGS QUADRANGLE MAP

STANDISH QUADRANGLE
MICHIGAN
7.5-MINUTE SERIES



Produced by the United States Geological Survey
 North American Datum of 1983 (NAD83)
 World Geodetic System of 1984 (WGS84) Projection and
 1:50,000-meter grid/Universal Transverse Mercator Zone 18Q UTM
 This map is not a legal document. Boundaries may be
 generalized for this map scale. Private lands within government
 information may not be shown. Obtain permission before
 entering private lands.

Imagery: NIP, July 2014 - October 2014
 Roads: U.S. Census Bureau, 2010
 Names: U.S. Census Bureau, 2010
 Hydrography: National Hydrography Dataset, 2004-2010
 Contours: National Elevation Dataset, 2010
 Boundaries: National Imagery and Mapping Act, 2001-2010
 Public Land Survey System: BLM, 2010
 Wetlands: FWS National Wetlands Inventory, 2000



SCALE 1:24 000

0 0.5 1 KILOMETERS
 0 500 1000 METERS

0 1000 2000 3000 4000 5000 6000 7000 8000 9000 FEET

CONTOUR INTERVAL: 5 FEET
 NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the
 National Geospatial Program US Topographic Standard, 2011.
 A metadata file associated with this product is available at www.usgs.gov



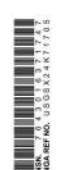
ROAD CLASSIFICATION

Expressway
 Secondary Hwy
 Ramp
 Interstate Route
 US Route
 State Route

Local Collector
 Local Road
 4RD
 US Route
 State Route

1 Starting
 2 Over Dam
 3 Other
 4 Aband. Forest
 5 Standish NE
 6 Course
 7 Proceeding

STANDISH, MI
2019

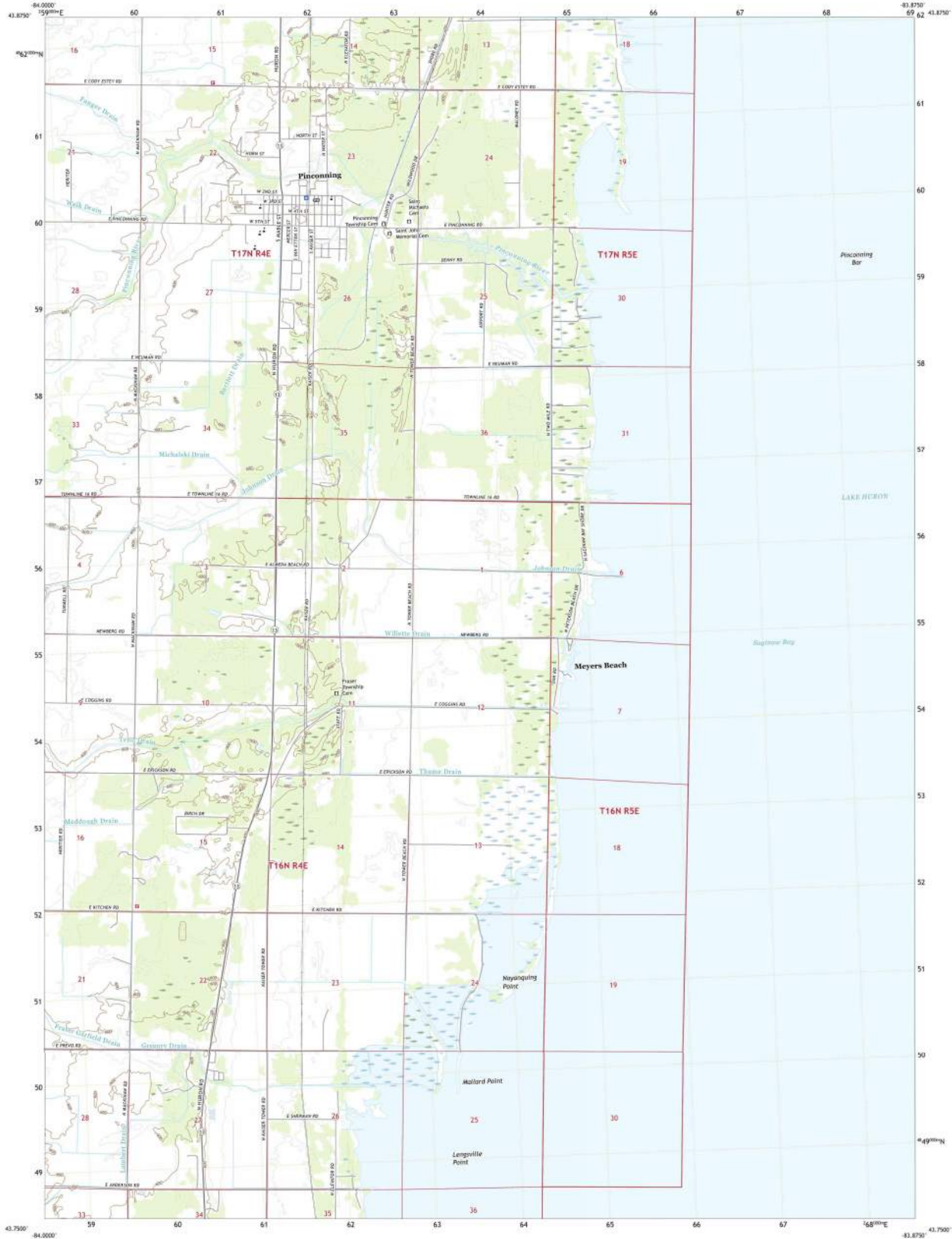




U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

USGS QUADRANGLE MAP

PINCONNING QUADRANGLE
MICHIGAN - BAY COUNTY
7.5-MINUTE SERIES

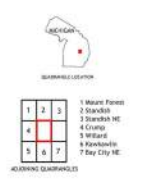
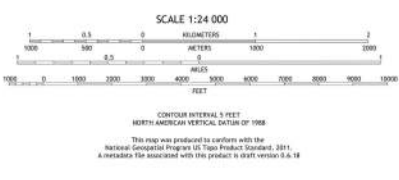


Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84), Projection and
1:500-meter grid/contour/Topographic Accuracy Zone (TAZ) 100/100
This map is not a legal document. Boundaries may be
generalized for this map scale. Source data within government
jurisdiction may not be shown. Obtain permission before
reproducing graphic data.

Imagery: NIP, July 2016 - October 2016
Base: U.S. Census Bureau, 2016
Hydrography: National Hydrography Dataset, 2019
Contours: National Elevation Dataset, 2019
Boundaries: Multiple sources, see metadata file 2017
Public Land Survey System: BLM, 2018
Waterbodies: FWS National Wetlands Inventory, 2002

UTM GRID AND 2018 MAGNETIC NORTH
DECLINATION BY QUADRANGLE

UTM Zone	UTM Easting	UTM Northing	Magnetic North	True North
18Q	100	700	10.0°	0.0°
18Q	100	700	10.0°	0.0°

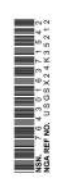


ROAD CLASSIFICATION

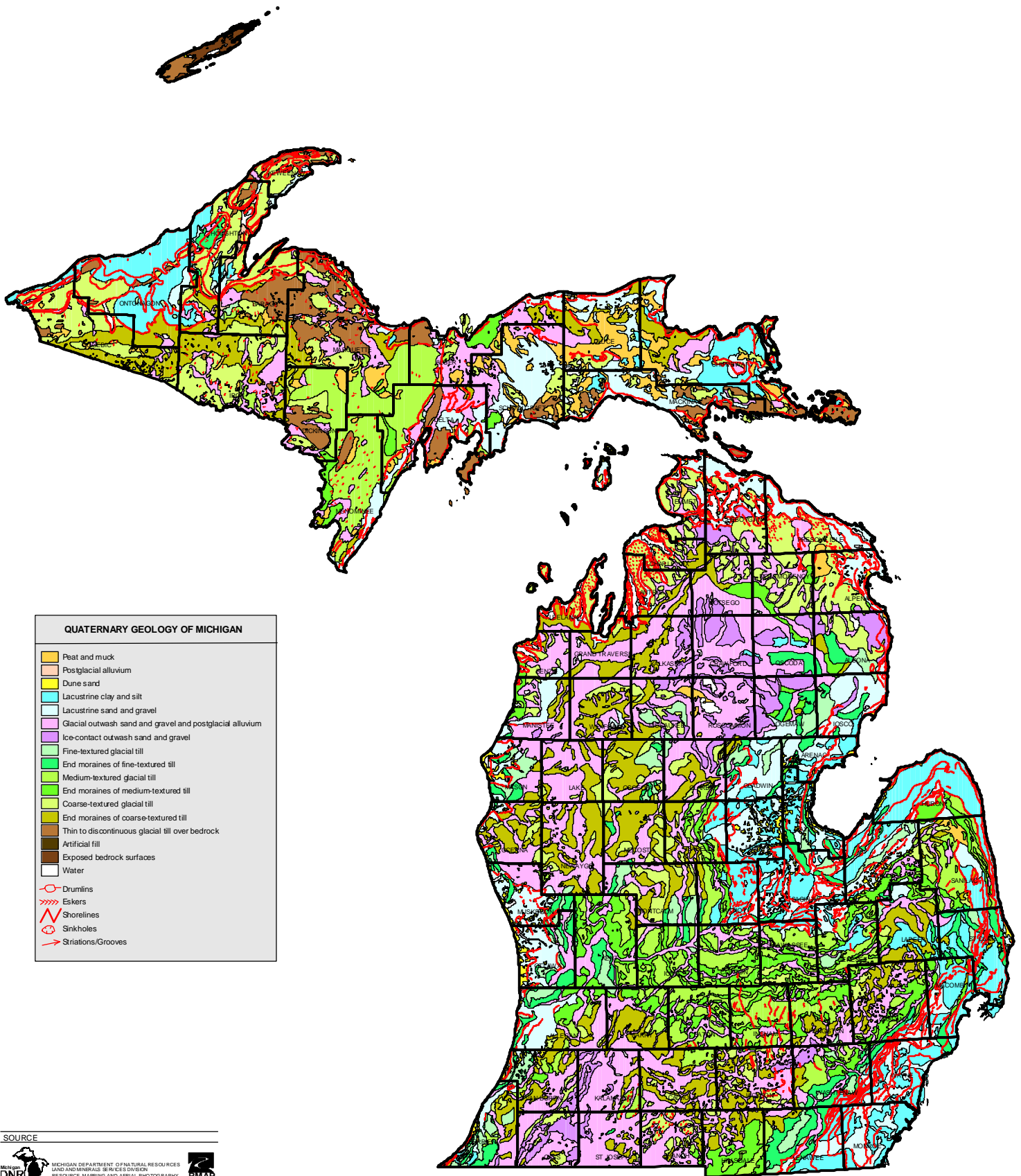
Expressway	Local Collector
Secondary Hwy	Local Road
Route	4AD
Interstate Route	US Route
	State Route

1 Water Forest
2 Swath
3 Swath ME
4 Camp
5 Wetland
6 Marsh
7 City

PINCONNING, MI
2019



1982 QUATERNARY GEOLOGY OF MICHIGAN



QUATERNARY GEOLOGY OF MICHIGAN

- Peat and muck
- Postglacial alluvium
- Dune sand
- Lacustrine clay and silt
- Lacustrine sand and gravel
- Glacial outwash sand and gravel and postglacial alluvium
- Ice-contact outwash sand and gravel
- Fine-textured glacial till
- End moraines of fine-textured till
- Medium-textured glacial till
- End moraines of medium-textured till
- Coarse-textured glacial till
- End moraines of coarse-textured till
- Thin to discontinuous glacial till over bedrock
- Artificial fill
- Exposed bedrock surfaces
- Water

- Drumlins
- Eskers
- Shorelines
- Sinkholes
- Striations/Grooves

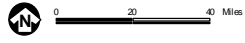
SOURCE

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
 LAND AND MINERALS SERVICES DIVISION
 RESOURCE MAPPING AND AERIAL PHOTOGRAPHY

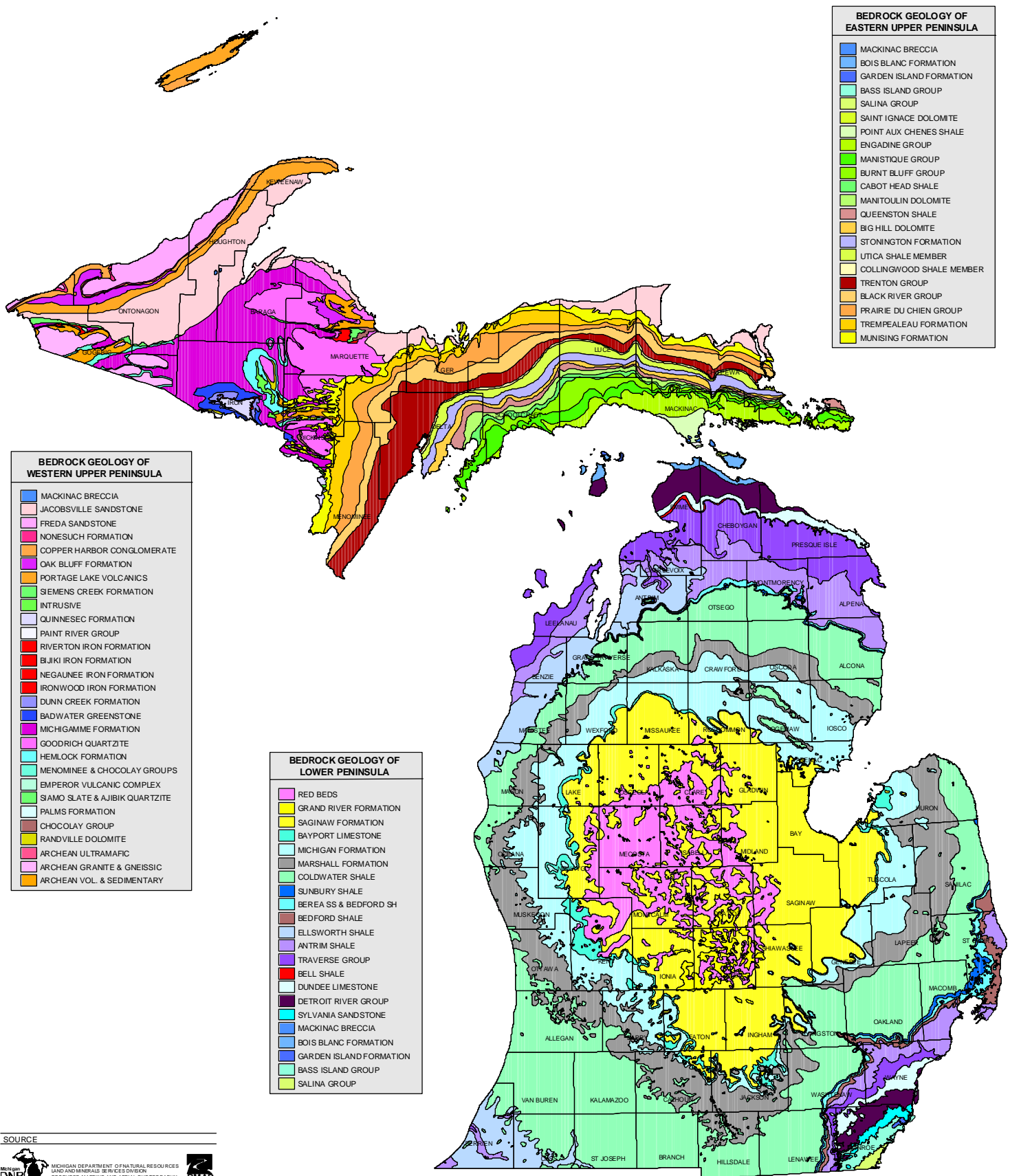
Michigan Resource Information System
 Part 650, Resource Inventory, of the Natural Resources and
 Environmental Protection Act, 1994 PA 451, as amended.

Automated from "Quaternary Geology of Michigan", 1982, 1:500,000 scale, which was compiled
 by W. R. Flanagan, University of Michigan and the Michigan Department of Environmental Quality
 Geological Survey Division.

Date: 11/12/99



1987 BEDROCK GEOLOGY OF MICHIGAN



BEDROCK GEOLOGY OF EASTERN UPPER PENINSULA

- MACKINAC BRECCIA
- BOIS BLANC FORMATION
- GARDEN ISLAND FORMATION
- BASS ISLAND GROUP
- SALINA GROUP
- SAINT IGNACE DOLOMITE
- POINT AUX CHENES SHALE
- ENGADINE GROUP
- MANISTIQUE GROUP
- BURN'T BLUFF GROUP
- CABOT HEAD SHALE
- MANITOULIN DOLOMITE
- QUEENSTON SHALE
- BIG HILL DOLOMITE
- STONINGTON FORMATION
- UTICA SHALE MEMBER
- COLLINGWOOD SHALE MEMBER
- TRENTON GROUP
- BLACK RIVER GROUP
- PRAIRIE DU CHIEN GROUP
- TREMPEALEAU FORMATION
- MUNISING FORMATION

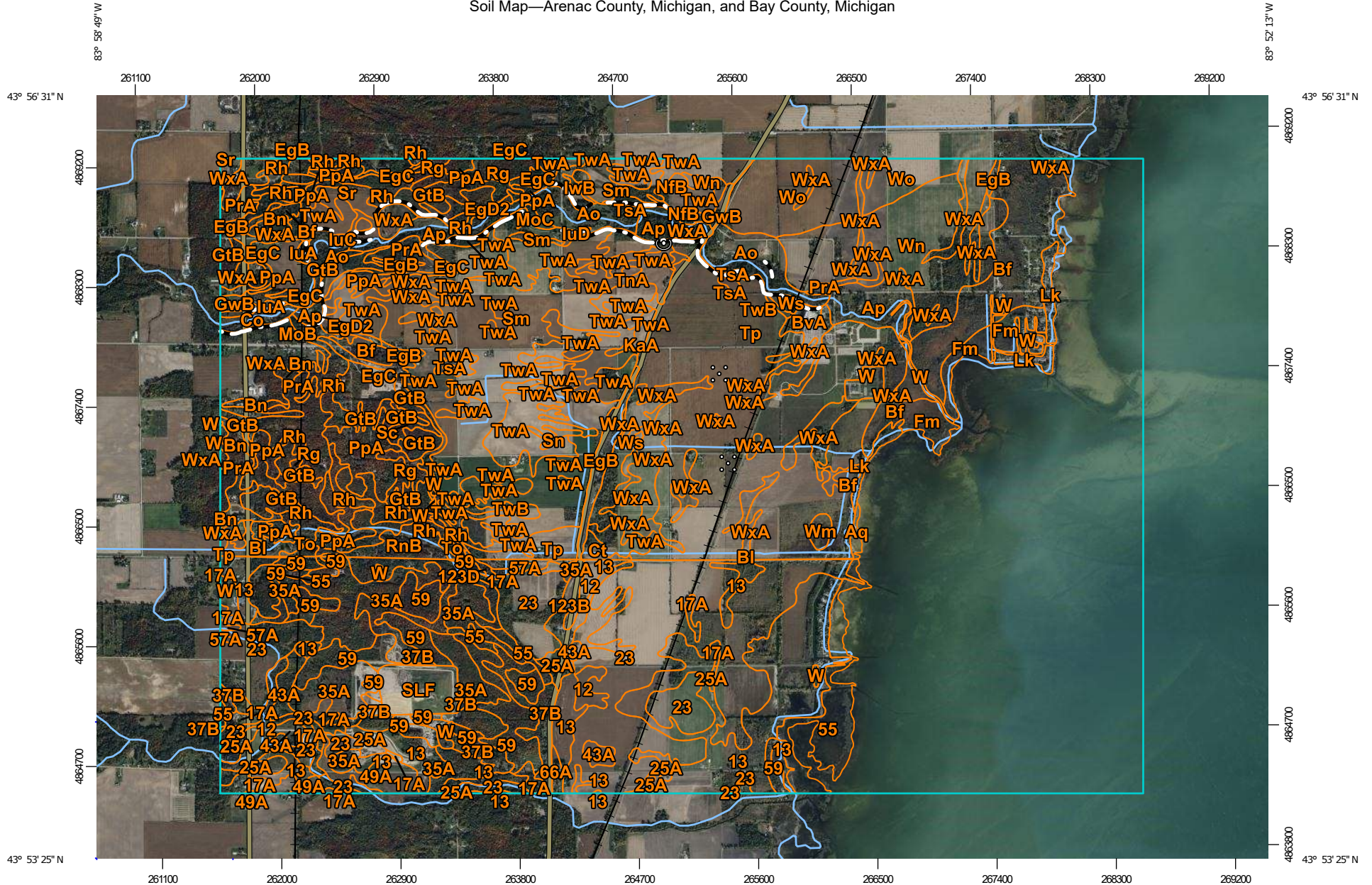
BEDROCK GEOLOGY OF WESTERN UPPER PENINSULA

- MACKINAC BRECCIA
- JACOBSVILLE SANDSTONE
- FREDA SANDSTONE
- NONESUCH FORMATION
- COPPER HARBOR CONGLOMERATE
- OAK BLUFF FORMATION
- PORTAGE LAKE VOLCANICS
- SIEMENS CREEK FORMATION
- INTRUSIVE
- QUINNESEC FORMATION
- PAINT RIVER GROUP
- RIVERTON IRON FORMATION
- BIJIKI IRON FORMATION
- NEGAUNEE IRON FORMATION
- IRONWOOD IRON FORMATION
- DUNN CREEK FORMATION
- BADWATER GREENSTONE
- MICHIGAMME FORMATION
- GOODRICH QUARTZITE
- HEMLOCK FORMATION
- MENOMINEE & CHOCOLAY GROUPS
- EMPEROR VULCANIC COMPLEX
- SIAMO SLATE & AJIBIK QUARTZITE
- PALMS FORMATION
- CHOCOLAY GROUP
- RANDVILLE DOLOMITE
- ARCHEAN ULTRAMAFIC
- ARCHEAN GRANITE & GNEISSIC
- ARCHEAN VOL. & SEDIMENTARY

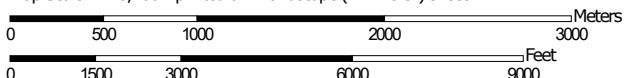
BEDROCK GEOLOGY OF LOWER PENINSULA

- RED BEDS
- GRAND RIVER FORMATION
- SAGINAW FORMATION
- BAYPORT LIMESTONE
- MICHIGAN FORMATION
- MARSHALL FORMATION
- COLDWATER SHALE
- SUNBURY SHALE
- BEREA SS & BEDFORD SH
- BEDFORD SHALE
- ELLSWORTH SHALE
- ANTRIM SHALE
- TRAVERSE GROUP
- BELL SHALE
- DUNDEE LIMESTONE
- DETROIT RIVER GROUP
- SYLVANIA SANDSTONE
- MACKINAC BRECCIA
- BOIS BLANC FORMATION
- GARDEN ISLAND FORMATION
- BASS ISLAND GROUP
- SALINA GROUP

Soil Map—Arenac County, Michigan, and Bay County, Michigan



Map Scale: 1:40,400 if printed on A landscape (11" x 8.5") sheet.



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: Arenac County, Michigan
Survey Area Data: Version 19, Aug 24, 2022

Soil Survey Area: Bay County, Michigan
Survey Area Data: Version 20, Aug 24, 2022

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 10, 2022—Nov 3, 2022

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

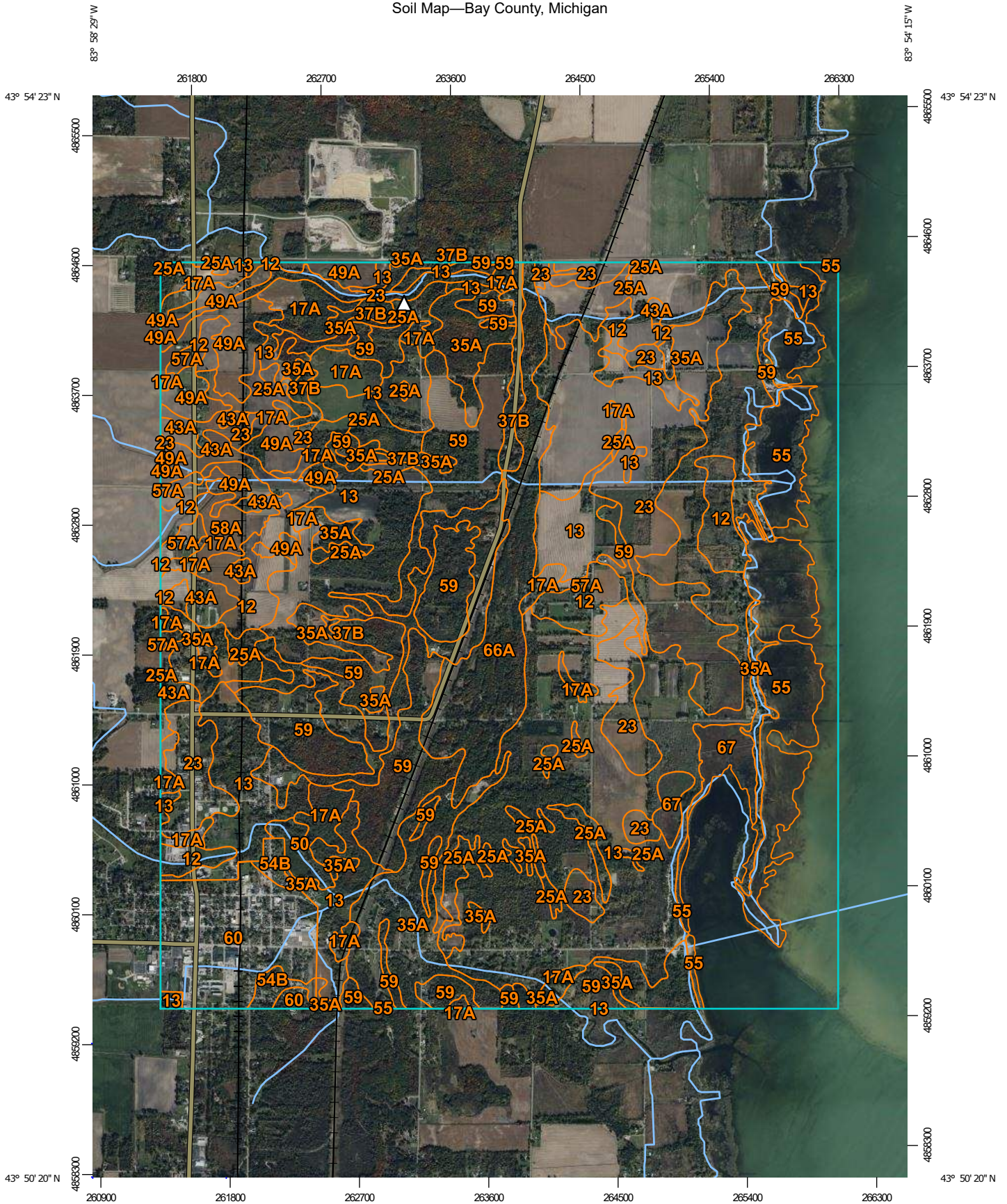
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ao	Alluvial land, medium	132.9	1.6%
Ap	Alluvial land, moderately fine	110.4	1.3%
Aq	Aquents, sandy and loamy	5.2	0.1%
Bf	Brevort fine sandy loam	225.1	2.7%
Bl	Belleville loamy sand	19.0	0.2%
Bn	Brevort loamy sand	22.9	0.3%
BvA	Brimley loamy fine sand, 0 to 2 percent slopes	5.4	0.1%
Co	Cohoctah loamy fine sand	14.3	0.2%
Ct	Corunna-Tappan sandy loams	8.3	0.1%
EgB	Eastport-Grattan sands, 0 to 6 percent slopes	39.6	0.5%
EgC	Eastport-Grattan sands, 6 to 12 percent slopes	67.3	0.8%
EgD	Eastport-Grattan sands, 12 to 18 percent slopes	10.7	0.1%
EgD2	Eastport-Grattan sands, 12 to 18 percent slopes, moderately eroded	29.9	0.4%
Fm	Fresh water marsh	69.7	0.8%
GtB	Grattan sand, 0 to 6 percent slopes	163.9	2.0%
GwB	Grattan sand, moderately fine substratum, 0 to 6 percent slopes	11.6	0.1%
IuA	Isabella-Ubly loamy sands, 0 to 2 percent slopes	6.2	0.1%
IuC	Isabella-Ubly loamy sands, 6 to 12 percent slopes	3.5	0.0%
IuD	Isabella-Ubly loamy sands, 12 to 18 percent slopes	2.2	0.0%
IwB	Isabella-Ubly sandy loams, 2 to 6 percent slopes	2.3	0.0%
KaA	Kawkawlin loam, 0 to 2 percent slopes	8.8	0.1%
Lk	Lake beach	39.7	0.5%
MoB	Menominee loamy sand, 2 to 6 percent slopes	2.3	0.0%
MoC	Menominee loamy sand, 6 to 12 percent slopes	3.8	0.0%
NfB	Nester fine sandy loam, 2 to 6 percent slopes	8.5	0.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PpA	Pipestone sand, Erie-Huron Lake Plain, 0 to 3 percent slopes	172.7	2.1%
PrA	Pipestone sand, loamy substratum, 0 to 2 percent slopes	145.6	1.8%
PrB	Pipestone sand, loamy substratum, 2 to 6 percent slopes	3.8	0.0%
Rg	Roscommon loamy sand	50.6	0.6%
Rh	Roscommon sand	124.2	1.5%
RnB	Rousseau fine sand, 0 to 6 percent slopes	30.2	0.4%
Sc	Saugatuck sand	15.0	0.2%
Sm	Sims clay loam	595.8	7.2%
Sn	Sims loam	6.1	0.1%
Sr	Sims sandy loam	25.0	0.3%
TnA	Twining loam, 0 to 2 percent slopes	2.1	0.0%
To	Tobico fine sand	5.5	0.1%
Tp	Tappan loam, 0 to 1 percent slopes	737.2	8.9%
TsA	Twining-Belding loamy sands, 0 to 2 percent slopes	9.9	0.1%
Tt	Timakwa peat and muck	3.4	0.0%
TwA	Twining-Belding sandy loams, 0 to 2 percent slopes	452.0	5.5%
TwB	Twining-Belding sandy loams, 2 to 6 percent slopes	14.4	0.2%
W	Water	30.8	0.4%
Wm	Willette muck	8.8	0.1%
Wn	Wisner clay loam	255.5	3.1%
Wo	Wisner loam	166.7	2.0%
Ws	Wisner sandy loam	61.2	0.7%
WxA	Selfridge loamy sand, 0 to 3 percent slopes	346.7	4.2%
Subtotals for Soil Survey Area		4,276.8	51.9%
Totals for Area of Interest		8,246.2	100.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
12	Corunna-Tappan sandy loams	65.8	0.8%
13	Belleville loamy sand	411.4	5.0%
17A	Selfridge loamy sand, 0 to 3 percent slopes	45.2	0.5%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
23	Tappan loam, 0 to 1 percent slopes	630.5	7.6%
25A	Pipestone fine sand, loamy substratum, 0 to 3 percent slopes	41.7	0.5%
35A	Pipestone sand, Erie-Huron Lake Plain, 0 to 3 percent slopes	247.8	3.0%
37B	Rousseau fine sand, 0 to 6 percent slopes	144.7	1.8%
43A	Londo loam, 0 to 3 percent slopes	42.8	0.5%
49A	Londo-Poseyville complex, 0 to 3 percent slopes	34.8	0.4%
55	Aquents, sandy and loamy	101.7	1.2%
57A	Poseyville loamy sand, 0 to 3 percent slopes	4.9	0.1%
59	Tobico fine sand	190.5	2.3%
66A	Pipestone-Tobico fine sands, 0 to 3 percent slopes	5.8	0.1%
123B	Eastport-Grattan sands, 0 to 6 percent slopes	21.0	0.3%
123D	Eastport-Grattan sands, 12 to 18 percent slopes	2.4	0.0%
SLF	Sanitary landfill	53.1	0.6%
W	Water	10.1	0.1%
Subtotals for Soil Survey Area		2,054.2	24.9%
Totals for Area of Interest		8,246.2	100.0%

Soil Map—Bay County, Michigan



Map Scale: 1:36,500 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84



Natural Resources Conservation Service

Web Soil Survey National Cooperative Soil Survey




3/17/2023 Page 1 of 3

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: Bay County, Michigan
 Survey Area Data: Version 20, Aug 24, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

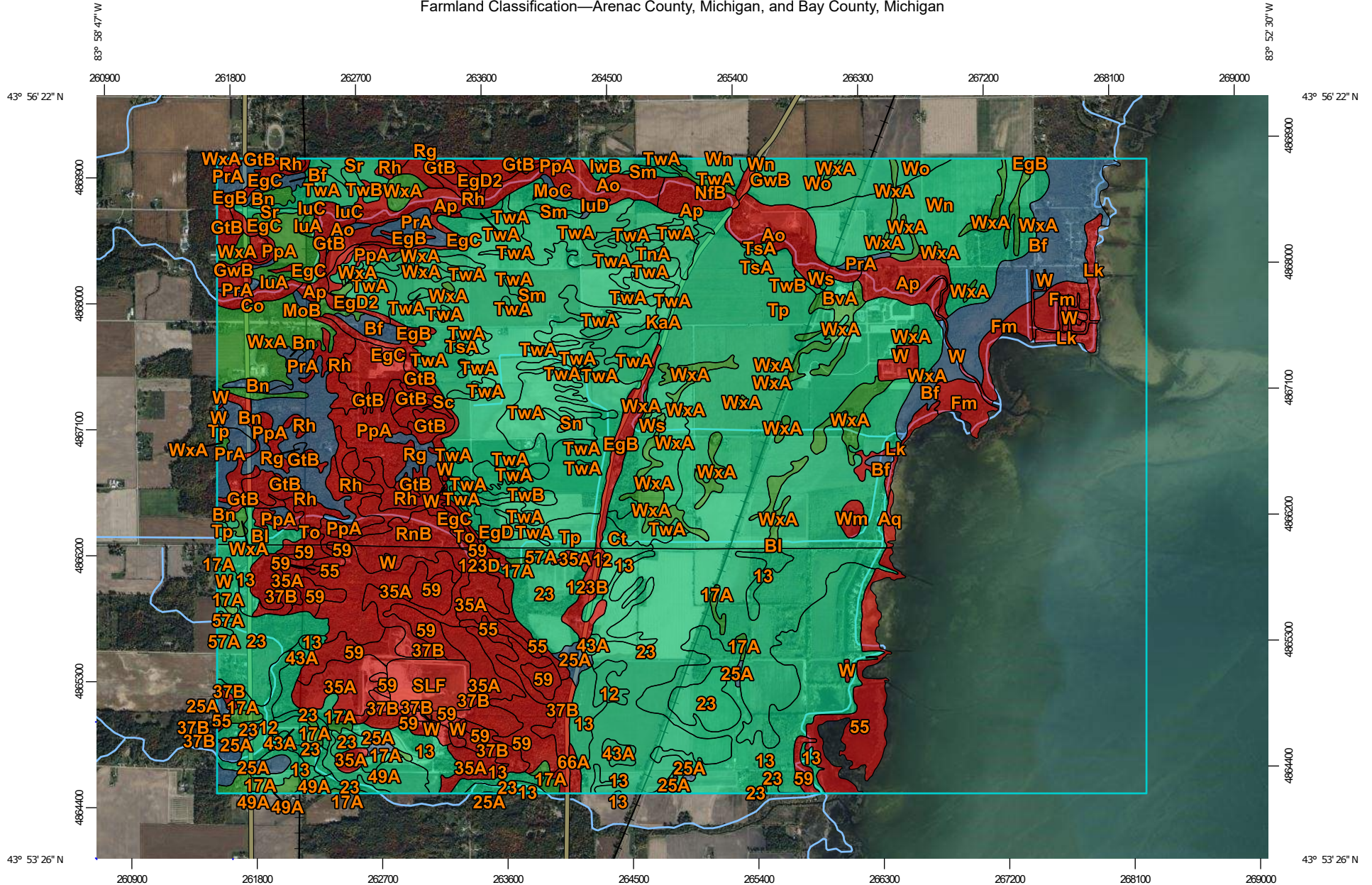
Date(s) aerial images were photographed: Oct 10, 2022—Nov 3, 2022

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.

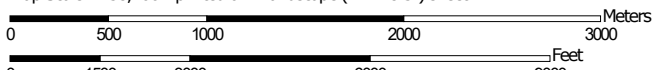
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
12	Corunna-Tappan sandy loams	269.2	4.4%
13	Belleville loamy sand	1,588.0	26.3%
17A	Selfridge loamy sand, 0 to 3 percent slopes	257.6	4.3%
23	Tappan loam, 0 to 1 percent slopes	687.0	11.4%
25A	Pipestone fine sand, loamy substratum, 0 to 3 percent slopes	186.0	3.1%
35A	Pipestone sand, Erie-Huron Lake Plain, 0 to 3 percent slopes	564.9	9.3%
37B	Rousseau fine sand, 0 to 6 percent slopes	55.8	0.9%
43A	Londo loam, 0 to 3 percent slopes	74.1	1.2%
49A	Londo-Poseyville complex, 0 to 3 percent slopes	191.6	3.2%
50	Cohoctah loamy fine sand	24.2	0.4%
54B	Urban land-Rousseau complex, 0 to 6 percent slopes	30.1	0.5%
55	Aquents, sandy and loamy	347.3	5.7%
57A	Poseyville loamy sand, 0 to 3 percent slopes	34.2	0.6%
58A	Tappan-Poseyville complex, 0 to 3 percent slopes	38.0	0.6%
59	Tobico fine sand	647.5	10.7%
60	Urban land-Essexville complex	218.4	3.6%
66A	Pipestone-Tobico fine sands, 0 to 3 percent slopes	250.1	4.1%
67	Belleville loamy sand, ponded	61.7	1.0%
Totals for Area of Interest		6,049.6	100.0%

Farmland Classification—Arenac County, Michigan, and Bay County, Michigan



Map Scale: 1:38,400 if printed on A landscape (11" x 8.5") sheet.



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 Rating Polygons

-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained
-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season









-  Prime farmland if subsoiled, completely removing the root inhibiting soil layer
-  Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
-  Prime farmland if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance
-  Farmland of statewide importance, if drained
-  Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
-  Farmland of statewide importance, if irrigated

-  Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
-  Farmland of statewide importance, if irrigated and drained
-  Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
-  Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
-  Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60



































-  Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
-  Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
-  Farmland of statewide importance, if warm enough
-  Farmland of statewide importance, if thawed
-  Farmland of local importance
-  Farmland of local importance, if irrigated

-  Farmland of unique importance
-  Not rated or not available

Soil Rating Lines

-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained
-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Farmland Classification—Arenac County, Michigan, and Bay County, Michigan

	Prime farmland if subsoiled, completely removing the root inhibiting soil layer		Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season		Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium		Farmland of unique importance		Prime farmland if subsoiled, completely removing the root inhibiting soil layer
	Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60		Farmland of statewide importance, if irrigated and drained		Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season		Soil Rating Points Not prime farmland		Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
	Prime farmland if irrigated and reclaimed of excess salts and sodium		Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season		Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season		Prime farmland if drained		Prime farmland if irrigated and reclaimed of excess salts and sodium
	Farmland of statewide importance		Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer		Farmland of statewide importance, if warm enough		Prime farmland if protected from flooding or not frequently flooded during the growing season		Farmland of statewide importance
	Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season		Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60		Farmland of statewide importance, if thawed		Prime farmland if irrigated		Farmland of statewide importance, if drained
	Farmland of statewide importance, if irrigated				Farmland of local importance		Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season		Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
					Farmland of local importance, if irrigated		Prime farmland if irrigated and drained		Farmland of statewide importance, if irrigated
							Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season		

Farmland Classification—Arenac County, Michigan, and Bay County, Michigan

<p> Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season</p> <p> Farmland of statewide importance, if irrigated and drained</p> <p> Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season</p> <p> Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer</p> <p> Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60</p>	<p> Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium</p> <p> Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season</p> <p> Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season</p> <p> Farmland of statewide importance, if warm enough</p> <p> Farmland of statewide importance, if thawed</p> <p> Farmland of local importance</p> <p> Farmland of local importance, if irrigated</p>	<p> Farmland of unique importance</p> <p> Not rated or not available</p> <p>Water Features</p> <p> Streams and Canals</p> <p>Transportation</p> <p> Rails</p> <p> Interstate Highways</p> <p> US Routes</p> <p> Major Roads</p> <p> Local Roads</p> <p>Background</p> <p> Aerial Photography</p>	<p>The soil surveys that comprise your AOI were mapped at 1:20,000.</p> <p>Please rely on the bar scale on each map sheet for map measurements.</p> <p>Source of Map: Natural Resources Conservation Service Web Soil Survey URL: Coordinate System: Web Mercator (EPSG:3857)</p> <p>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.</p> <p>This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.</p> <p>Soil Survey Area: Arenac County, Michigan Survey Area Data: Version 19, Aug 24, 2022</p> <p>Soil Survey Area: Bay County, Michigan Survey Area Data: Version 20, Aug 24, 2022</p> <p>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.</p> <p>Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.</p> <p>Date(s) aerial images were photographed: Oct 10, 2022—Nov 3, 2022</p> <p>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.</p>
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Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Ao	Alluvial land, medium	Not prime farmland	132.2	1.8%
Ap	Alluvial land, moderately fine	Not prime farmland	110.4	1.5%
Aq	Aquents, sandy and loamy	Not prime farmland	5.2	0.1%
Bf	Brevort fine sandy loam	Farmland of local importance	197.6	2.6%
Bl	Belleville loamy sand	Prime farmland if drained	19.4	0.3%
Bn	Brevort loamy sand	Farmland of local importance	23.6	0.3%
BvA	Brimley loamy fine sand, 0 to 2 percent slopes	Prime farmland if drained	5.4	0.1%
Co	Cohoctah loamy fine sand	Not prime farmland	14.9	0.2%
Ct	Corunna-Tappan sandy loams	Prime farmland if drained	8.3	0.1%
EgB	Eastport-Grattan sands, 0 to 6 percent slopes	Not prime farmland	37.1	0.5%
EgC	Eastport-Grattan sands, 6 to 12 percent slopes	Not prime farmland	51.8	0.7%
EgD	Eastport-Grattan sands, 12 to 18 percent slopes	Not prime farmland	7.5	0.1%
EgD2	Eastport-Grattan sands, 12 to 18 percent slopes, moderately eroded	Not prime farmland	29.4	0.4%
Fm	Fresh water marsh	Not prime farmland	69.7	0.9%
GtB	Grattan sand, 0 to 6 percent slopes	Not prime farmland	138.2	1.8%
GwB	Grattan sand, moderately fine substratum, 0 to 6 percent slopes	Not prime farmland	11.7	0.2%
IuA	Isabella-Ubly loamy sands, 0 to 2 percent slopes	All areas are prime farmland	6.2	0.1%
IuC	Isabella-Ubly loamy sands, 6 to 12 percent slopes	Farmland of local importance	3.5	0.0%
IuD	Isabella-Ubly loamy sands, 12 to 18 percent slopes	Farmland of local importance	2.2	0.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
lwB	Isabella-Ubly sandy loams, 2 to 6 percent slopes	All areas are prime farmland	1.0	0.0%
KaA	Kawkawlin loam, 0 to 2 percent slopes	Prime farmland if drained	8.8	0.1%
Lk	Lake beach	Not prime farmland	39.7	0.5%
MoB	Menominee loamy sand, 2 to 6 percent slopes	Farmland of local importance	2.3	0.0%
MoC	Menominee loamy sand, 6 to 12 percent slopes	Farmland of local importance	3.8	0.1%
NfB	Nester fine sandy loam, 2 to 6 percent slopes	All areas are prime farmland	6.2	0.1%
PpA	Pipestone sand, Erie-Huron Lake Plain, 0 to 3 percent slopes	Not prime farmland	143.2	1.9%
PrA	Pipestone sand, loamy substratum, 0 to 2 percent slopes	Farmland of local importance	149.1	2.0%
PrB	Pipestone sand, loamy substratum, 2 to 6 percent slopes	Farmland of local importance	3.8	0.1%
Rg	Roscommon loamy sand	Farmland of local importance	20.7	0.3%
Rh	Roscommon sand	Not prime farmland	104.2	1.4%
RnB	Rousseau fine sand, 0 to 6 percent slopes	Not prime farmland	30.2	0.4%
Sc	Saugatuck sand	Not prime farmland	15.0	0.2%
Sm	Sims clay loam	Prime farmland if drained	563.1	7.5%
Sn	Sims loam	Prime farmland if drained	6.1	0.1%
Sr	Sims sandy loam	Prime farmland if drained	22.4	0.3%
TnA	Twining loam, 0 to 2 percent slopes	Prime farmland if drained	2.1	0.0%
To	Tobico fine sand	Not prime farmland	5.5	0.1%
Tp	Tappan loam, 0 to 1 percent slopes	Prime farmland if drained	738.1	9.8%
TsA	Twining-Belding loamy sands, 0 to 2 percent slopes	Prime farmland if drained	9.9	0.1%
TwA	Twining-Belding sandy loams, 0 to 2 percent slopes	Prime farmland if drained	411.0	5.5%
TwB	Twining-Belding sandy loams, 2 to 6 percent slopes	Prime farmland if drained	14.4	0.2%
W	Water	Not prime farmland	31.2	0.4%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Wm	Willette muck	Not prime farmland	8.8	0.1%
Wn	Wisner clay loam	Prime farmland if drained	232.7	3.1%
Wo	Wisner loam	Prime farmland if drained	84.6	1.1%
Ws	Wisner sandy loam	Prime farmland if drained	61.2	0.8%
WxA	Selfridge loamy sand, 0 to 3 percent slopes	All areas are prime farmland	337.4	4.5%
Subtotals for Soil Survey Area			3,930.8	52.4%
Totals for Area of Interest			7,503.7	100.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
12	Corunna-Tappan sandy loams	Prime farmland if drained	66.7	0.9%
13	Belleville loamy sand	Prime farmland if drained	409.9	5.5%
17A	Selfridge loamy sand, 0 to 3 percent slopes	All areas are prime farmland	44.8	0.6%
23	Tappan loam, 0 to 1 percent slopes	Prime farmland if drained	633.1	8.4%
25A	Pipestone fine sand, loamy substratum, 0 to 3 percent slopes	Farmland of local importance	44.3	0.6%
35A	Pipestone sand, Erie-Huron Lake Plain, 0 to 3 percent slopes	Not prime farmland	247.7	3.3%
37B	Rousseau fine sand, 0 to 6 percent slopes	Not prime farmland	145.0	1.9%
43A	Londo loam, 0 to 3 percent slopes	Prime farmland if drained	42.8	0.6%
49A	Londo-Poseyville complex, 0 to 3 percent slopes	Prime farmland if drained	33.9	0.5%
55	Aquents, sandy and loamy	Not prime farmland	101.6	1.4%
57A	Poseyville loamy sand, 0 to 3 percent slopes	Prime farmland if drained	5.7	0.1%
59	Tobico fine sand	Not prime farmland	190.3	2.5%
66A	Pipestone-Tobico fine sands, 0 to 3 percent slopes	Not prime farmland	5.7	0.1%
123B	Eastport-Grattan sands, 0 to 6 percent slopes	Not prime farmland	21.0	0.3%
123D	Eastport-Grattan sands, 12 to 18 percent slopes	Not prime farmland	2.4	0.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
SLF	Sanitary landfill	Not prime farmland	53.1	0.7%
W	Water	Not prime farmland	10.5	0.1%
Subtotals for Soil Survey Area			2,058.5	27.4%
Totals for Area of Interest			7,503.7	100.0%

Description

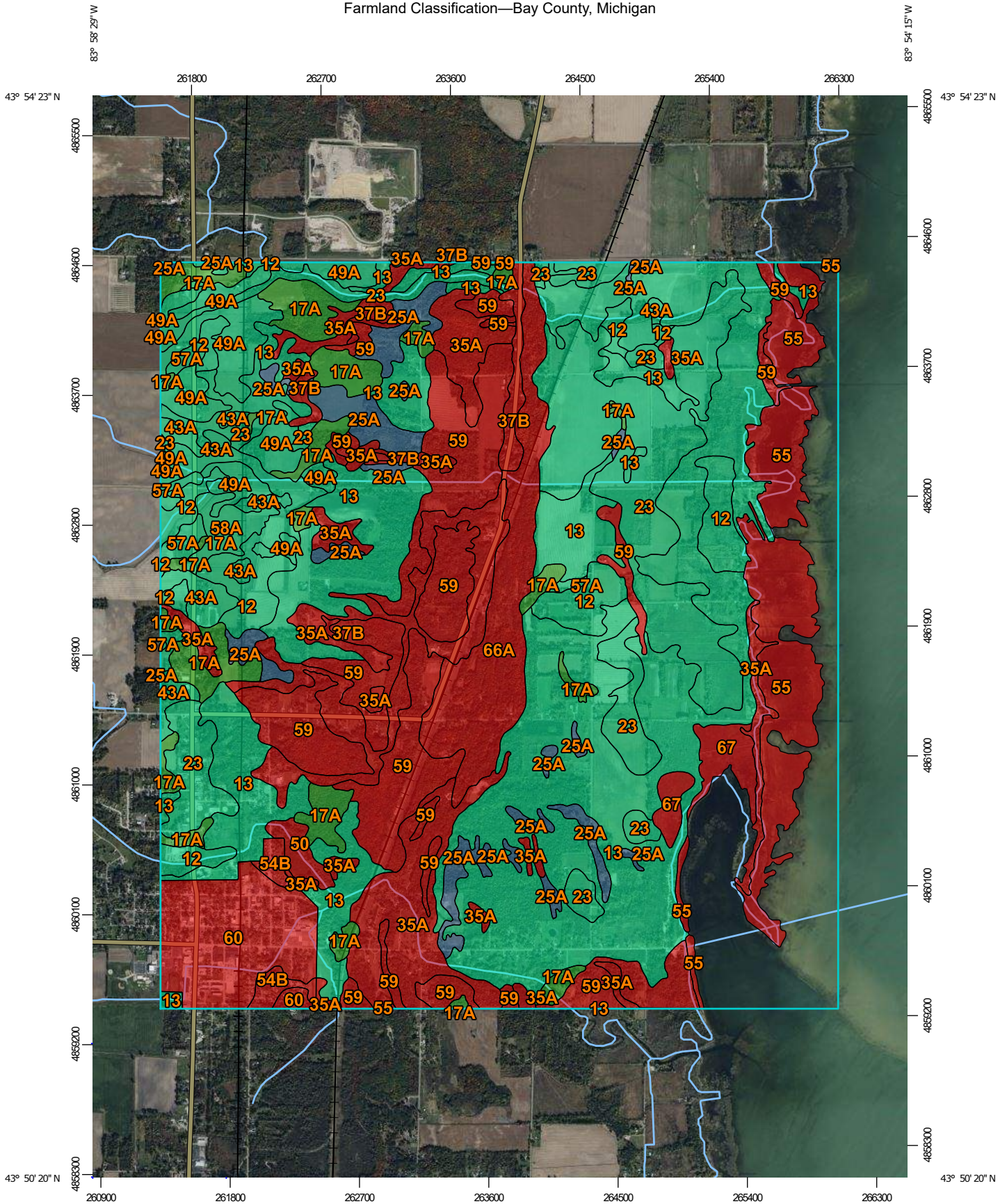
Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

Farmland Classification—Bay County, Michigan



Map Scale: 1:36,500 if printed on A portrait (8.5" x 11") sheet.



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 Rating Polygons

-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained
-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season









-  Prime farmland if subsoiled, completely removing the root inhibiting soil layer
-  Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
-  Prime farmland if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance
-  Farmland of statewide importance, if drained
-  Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
-  Farmland of statewide importance, if irrigated

-  Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
-  Farmland of statewide importance, if irrigated and drained
-  Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
-  Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
-  Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
































-  Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
-  Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
-  Farmland of statewide importance, if warm enough
-  Farmland of statewide importance, if thawed
-  Farmland of local importance
-  Farmland of local importance, if irrigated

-  Farmland of unique importance
-  Not rated or not available

Soil Rating Lines

-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained
-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Farmland Classification—Bay County, Michigan

	Prime farmland if subsoiled, completely removing the root inhibiting soil layer		Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season		Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium		Farmland of unique importance		Prime farmland if subsoiled, completely removing the root inhibiting soil layer	
	Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60		Farmland of statewide importance, if irrigated and drained		Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season	Soil Rating Points		Not prime farmland		Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
	Prime farmland if irrigated and reclaimed of excess salts and sodium		Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season		Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season		Prime farmland if drained		Prime farmland if irrigated and reclaimed of excess salts and sodium	
	Farmland of statewide importance		Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer		Farmland of statewide importance, if warm enough		Prime farmland if irrigated		Farmland of statewide importance	
	Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season		Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60		Farmland of statewide importance, if thawed		Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season		Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season	
	Farmland of statewide importance, if irrigated				Farmland of local importance		Prime farmland if irrigated and drained		Farmland of statewide importance, if irrigated	
					Farmland of local importance, if irrigated		Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season			

Farmland Classification—Bay County, Michigan

Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season	Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium	Farmland of unique importance Not rated or not available	<p>The soil surveys that comprise your AOI were mapped at 1:20,000.</p>
Farmland of statewide importance, if irrigated and drained	Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season	<p>Water Features Streams and Canals </p>	<p>Please rely on the bar scale on each map sheet for map measurements.</p>
Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season	Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season	<p>Transportation</p>	<p>Source of Map: Natural Resources Conservation Service Web Soil Survey URL: Coordinate System: Web Mercator (EPSG:3857)</p>
Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer	Farmland of statewide importance, if warm enough	Rails	<p>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.</p>
Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60	Farmland of statewide importance, if thawed	Interstate Highways	<p>This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.</p>
	Farmland of local importance	US Routes	<p>Soil Survey Area: Bay County, Michigan Survey Area Data: Version 20, Aug 24, 2022</p>
	Farmland of local importance, if irrigated	Major Roads	<p>Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.</p>
		Local Roads	<p>Date(s) aerial images were photographed: Oct 10, 2022—Nov 3, 2022</p>
		<p>Background</p>	<p>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.</p>
		Aerial Photography	

Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
12	Corunna-Tappan sandy loams	Prime farmland if drained	269.2	4.4%
13	Belleville loamy sand	Prime farmland if drained	1,588.0	26.3%
17A	Selfridge loamy sand, 0 to 3 percent slopes	All areas are prime farmland	257.6	4.3%
23	Tappan loam, 0 to 1 percent slopes	Prime farmland if drained	687.0	11.4%
25A	Pipestone fine sand, loamy substratum, 0 to 3 percent slopes	Farmland of local importance	186.0	3.1%
35A	Pipestone sand, Erie-Huron Lake Plain, 0 to 3 percent slopes	Not prime farmland	564.9	9.3%
37B	Rousseau fine sand, 0 to 6 percent slopes	Not prime farmland	55.8	0.9%
43A	Londo loam, 0 to 3 percent slopes	Prime farmland if drained	74.1	1.2%
49A	Londo-Poseyville complex, 0 to 3 percent slopes	Prime farmland if drained	191.6	3.2%
50	Cohoctah loamy fine sand	Not prime farmland	24.2	0.4%
54B	Urban land-Rousseau complex, 0 to 6 percent slopes	Not prime farmland	30.1	0.5%
55	Aquents, sandy and loamy	Not prime farmland	347.3	5.7%
57A	Poseyville loamy sand, 0 to 3 percent slopes	Prime farmland if drained	34.2	0.6%
58A	Tappan-Poseyville complex, 0 to 3 percent slopes	Prime farmland if drained	38.0	0.6%
59	Tobico fine sand	Not prime farmland	647.5	10.7%
60	Urban land-Essexville complex	Not prime farmland	218.4	3.6%
66A	Pipestone-Tobico fine sands, 0 to 3 percent slopes	Not prime farmland	250.1	4.1%
67	Belleville loamy sand, ponded	Not prime farmland	61.7	1.0%
Totals for Area of Interest			6,049.6	100.0%

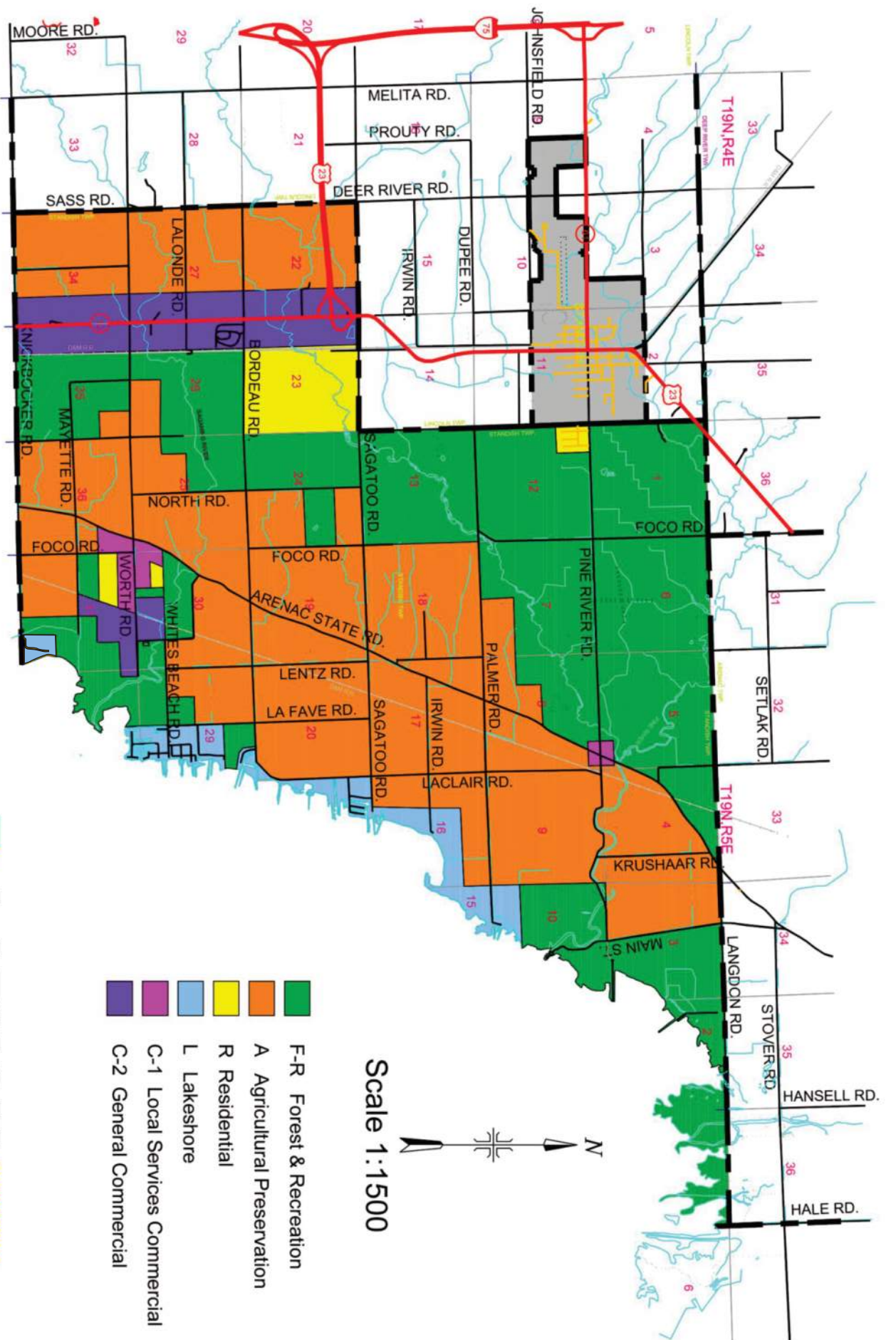
Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower



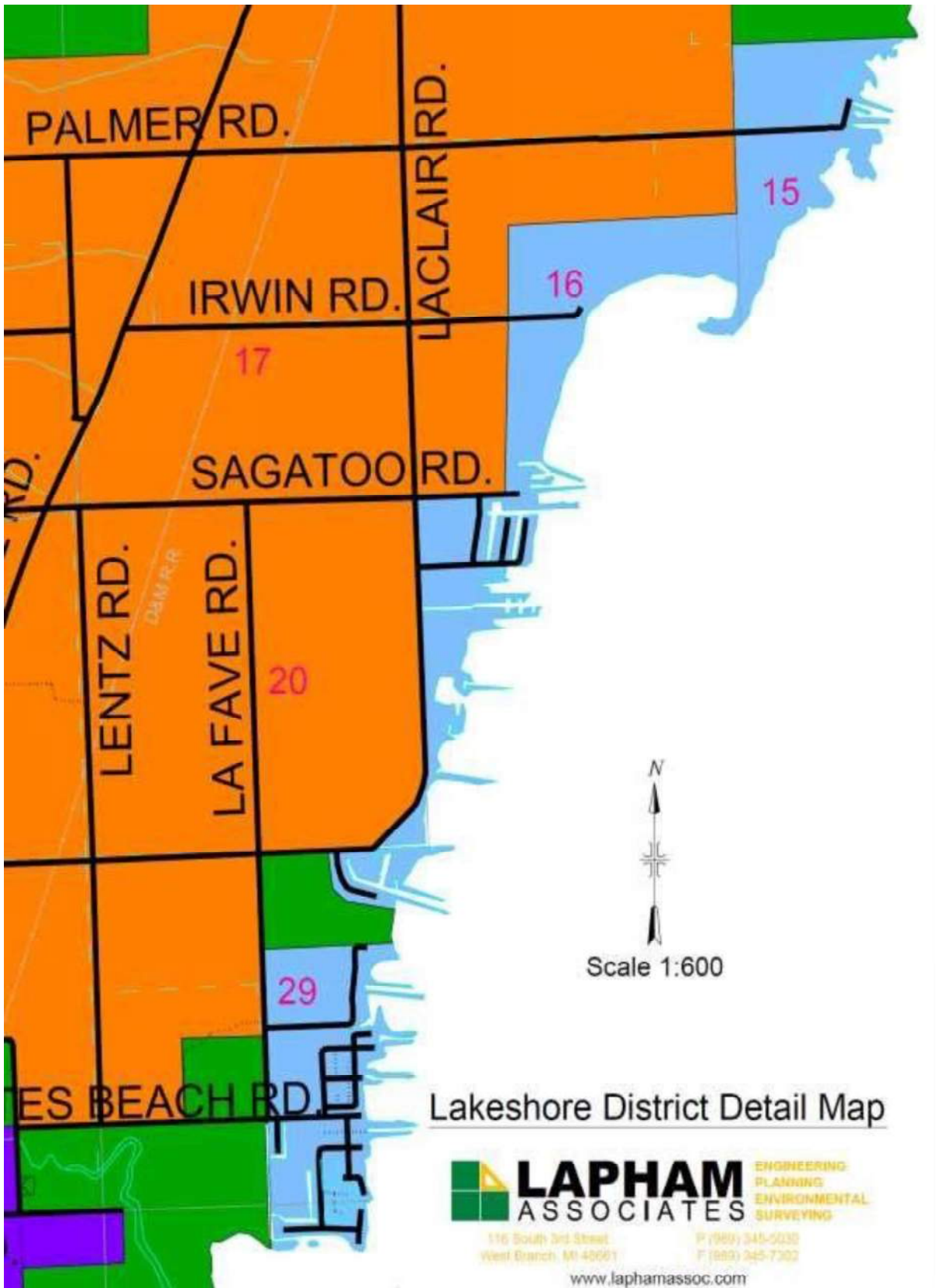
Standish Township Zoning District Map

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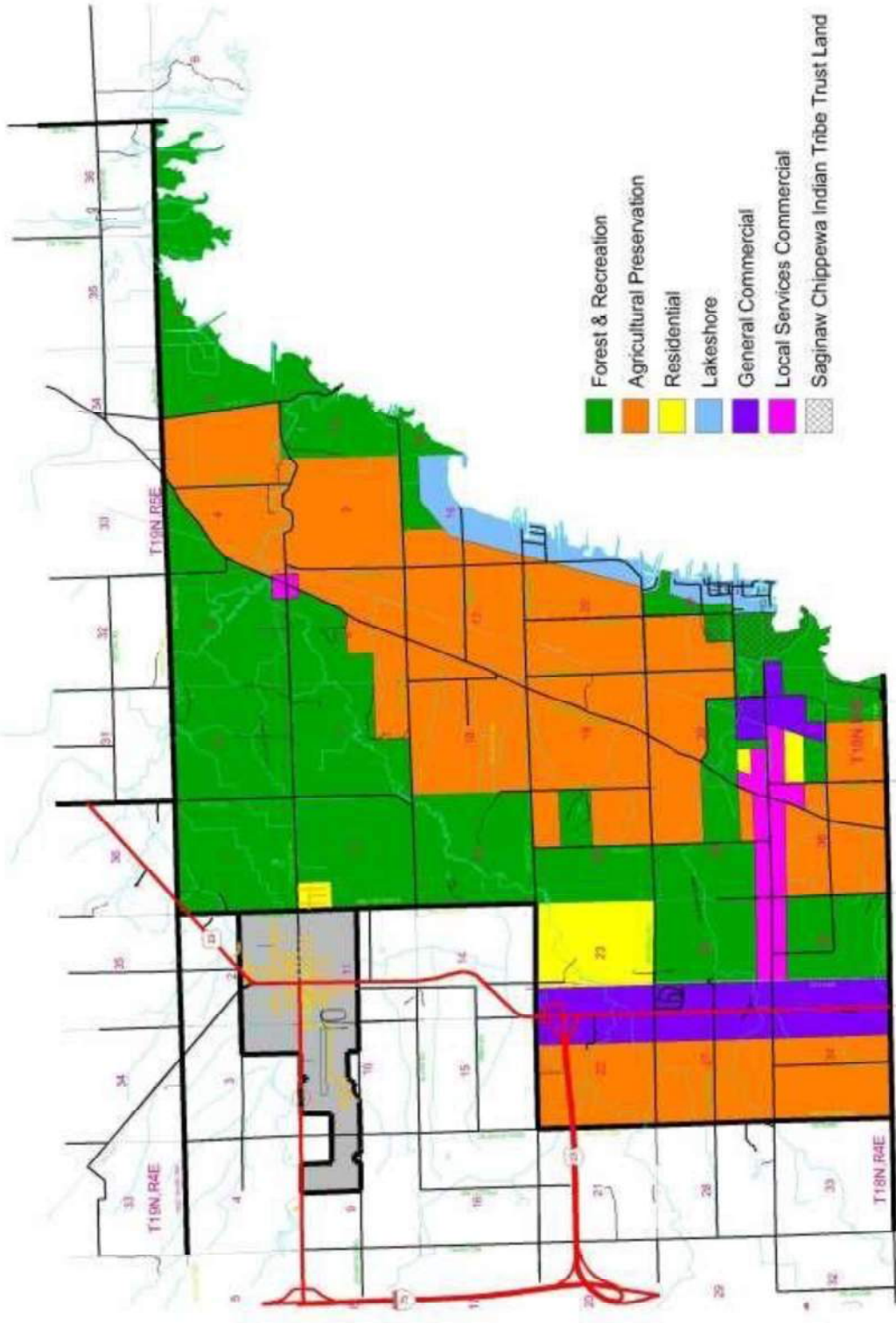
116 South 3rd Street
 West Branch, MI 48661
 P (989) 345-5030
 F (989) 345-7302

www.laphamassoc.com



Lakeshore District Detail Map

LAPHAM ASSOCIATES ENGINEERING PLANNING ENVIRONMENTAL SURVEYING
 116 South 3rd Street West Branch, MI 49091 P (989) 345-5030 F (989) 345-7302
www.laphamassoc.com



Standish Township Future Land Use Map

(See page 2-30 for Tribal Land Map)

Arenac County Coastal Zone Management Map

Arenac County

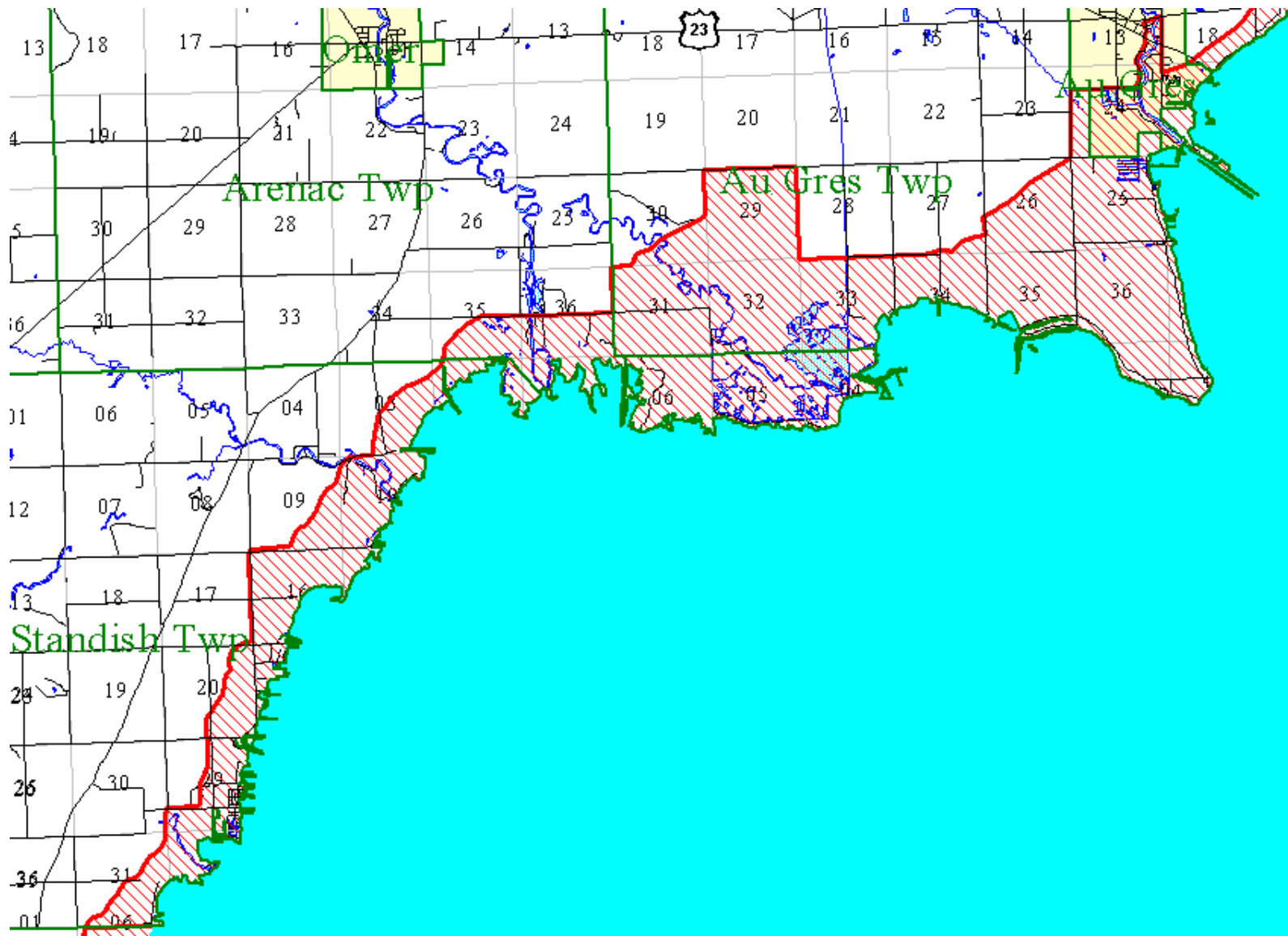
Standish Township, T18N R5E

Arenac Township, T19N R5E, T18N R5E and T18N R6E

Au Gres Township, T19N R6E, T18N R6E and T18N R7E

The heavy red line is the **Coastal Zone Management Boundary**

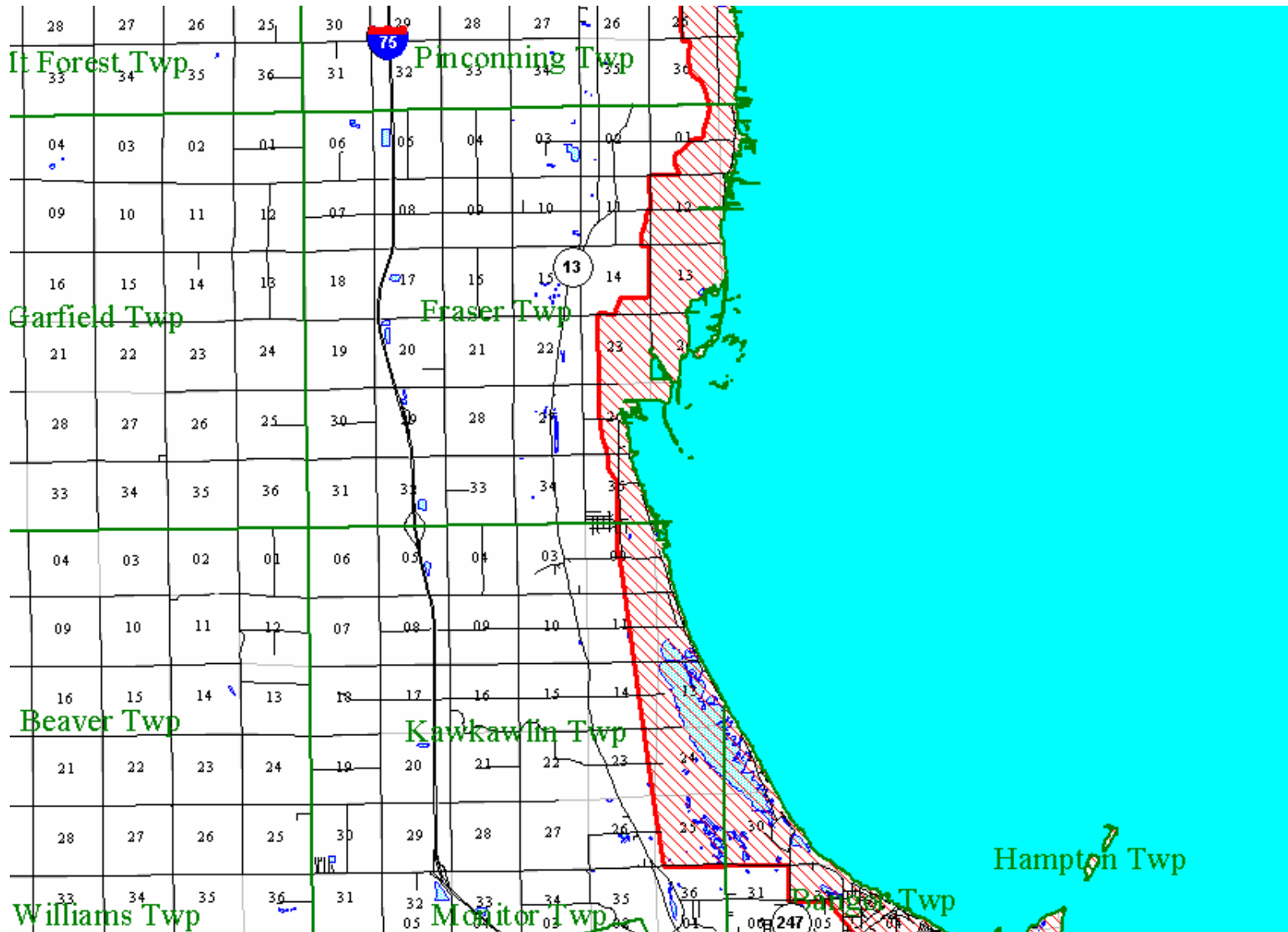
The red hatched area is the **Coastal Zone Management Area**



Bay County Coastal Zone Management Map

Bay County
Bangor Township, T15N R5E
Kawkawlin Township, T15N R4
Fraser Township, T16N R4E and T16N R5E

The heavy red line is the **Coastal Zone Management Boundary**
The red hatched area is the **Coastal Zone Management Area**



APPENDIX F

LISTS

- **ENDANGERED AND THREATENED SPECIES**
 - **CONTAMINATED SITES**

Endangered and Threatened Species List

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Arenac and Bay counties, Michigan



Local office

Michigan Ecological Services Field Office

☎ (517) 351-2555

📠 (517) 351-1443

2651 Coolidge Road Suite 101

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

-
1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
 2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of

Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Indiana Bat <i>Myotis sodalis</i> Wherever found There is final critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened
Tricolored Bat <i>Perimyotis subflavus</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

Birds

NAME	STATUS
Piping Plover <i>Charadrius melodus</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/6039	Endangered
Red Knot <i>Calidris canutus rufa</i> Wherever found This species only needs to be considered if the following condition applies: <ul style="list-style-type: none">• Only actions that occur along coastal areas during the Red Knot migratory window of MAY 1 - SEPTEMBER 30. There is proposed critical habitat for this species. https://ecos.fws.gov/ecp/species/1864	Threatened

Reptiles

NAME	STATUS
------	--------

Eastern Massasauga (=rattlesnake) *Sistrurus catenatus* Threatened

Wherever found

This species only needs to be considered if the following condition applies:

- For all Projects: Project is within EMR Range

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/2202>

Insects

NAME

STATUS

Monarch Butterfly *Danaus plexippus*

Candidate

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/9743>

Flowering Plants

NAME

STATUS

Eastern Prairie Fringed Orchid *Platanthera leucophaea*

Threatened

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/601>

Pitcher's Thistle *Cirsium pitcheri*

Threatened

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/8153>

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern \(BCC\)](#) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Golden-plover <i>Pluvialis dominica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Dec 1 to Aug 31

<p>Black Tern <i>Chlidonias niger</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3093</p>	Breeds May 15 to Aug 20
<p>Black-billed Cuckoo <i>Coccyzus erythrophthalmus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399</p>	Breeds May 15 to Oct 10
<p>Bobolink <i>Dolichonyx oryzivorus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 20 to Jul 31
<p>Canada Warbler <i>Cardellina canadensis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 20 to Aug 10
<p>Cerulean Warbler <i>Dendroica cerulea</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974</p>	Breeds Apr 20 to Jul 20
<p>Chimney Swift <i>Chaetura pelagica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds Mar 15 to Aug 25
<p>Common Tern <i>Sterna hirundo hirundo</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA</p>	Breeds May 1 to Aug 31
<p>Connecticut Warbler <i>Oporornis agilis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds Jun 15 to Aug 10
<p>Eastern Whip-poor-will <i>Antrostomus vociferus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 1 to Aug 20
<p>Golden-winged Warbler <i>Vermivora chrysoptera</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8745</p>	Breeds May 1 to Jul 20

<p>King Rail <i>Rallus elegans</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8936</p>	Breeds May 1 to Sep 5
<p>Lesser Yellowlegs <i>Tringa flavipes</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679</p>	Breeds elsewhere
<p>Marbled Godwit <i>Limosa fedoa</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481</p>	Breeds May 1 to Jul 31
<p>Olive-sided Flycatcher <i>Contopus cooperi</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914</p>	Breeds May 20 to Aug 31
<p>Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 10 to Sep 10
<p>Ruddy Turnstone <i>Arenaria interpres morinella</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA</p>	Breeds elsewhere
<p>Rusty Blackbird <i>Euphagus carolinus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA</p>	Breeds elsewhere
<p>Short-billed Dowitcher <i>Limnodromus griseus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480</p>	Breeds elsewhere
<p>Wood Thrush <i>Hylocichla mustelina</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

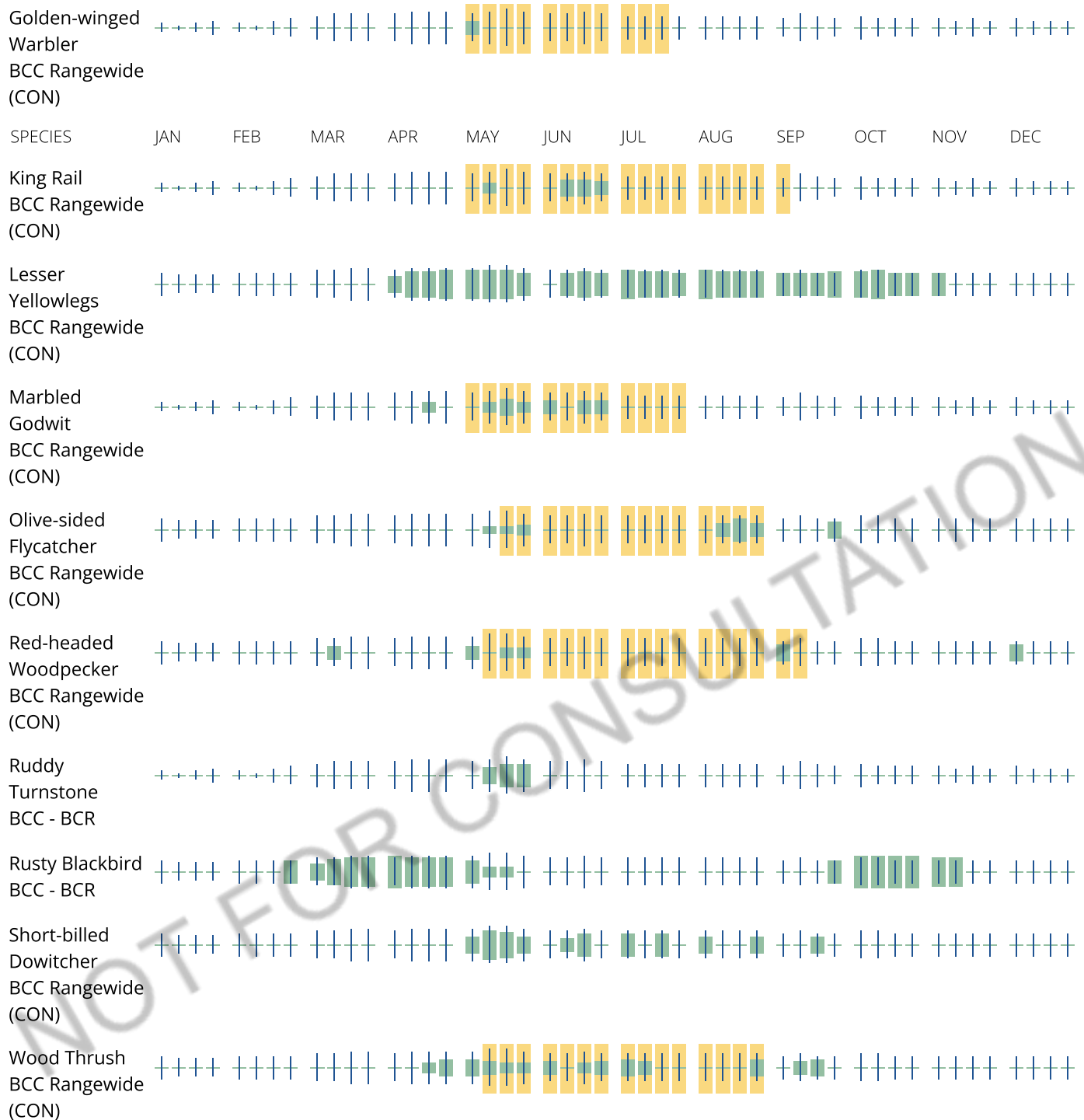
Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (—)

A week is marked as having no data if there were no survey events for that week.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the [NWI map](#) to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION

Contaminated Sites List

Open Part 201 Site

Site ID	Site Name	Address	City	Zip Code	County	Source	Pollutants	Latitude	Longitude	Horizontal Collection Method	Horizontal Reference Datum	Horizontal Accuracy in Meters	Reference Point	Source Map Scale
06000068	White St., 2148	2148 White St. Standish Twp. (Whites Beach/Saganing)	Whites Beach	48933	Arenac	Null	Null	43.931089	-83.890915	The geographic coordinate determination method based on interpolation-map.	North American Datum of 1983	10	Null	1:24,000

Show rows: ▼

Results: 1 – 1 of 1

