Areawide Water Quality Management Plan

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Toledo Metropolitan Area Council of Governments

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Areawide Water Quality Management Plan

Preface

The Toledo Metropolitan Area Council of Governments (TMACOG) Areawide Water Quality Management Plan is a comprehensive document required by Section 208 of the Clean Water Act of 1972. Commonly referred to as the "208 Plan", this document encompasses information from portions of northwest Ohio (Lucas, Ottawa, Sandusky, and Wood Counties) and southeast Michigan (Bedford, Erie, and Whiteford Townships in Monroe County). The aim of the 208 Plan is to develop and implement practices that achieve the goals of the Clean Water Act.

The original 208 Plan was prepared between 1976 and 1980, and major revisions to the entire plan were completed in 2003. Since that time, individual chapters have been updated as needed to maintain current information. TMACOG staff began a comprehensive update to the 208 Plan in 2021 with the final document planned for 2026. In the interim, formatting may be inconsistent between some chapters. The -nine chapters of the 208 Plan include:

Chapter	Title	Content	Last Updated
1	Areawide Overview	Introduction to the Plan and legal basis	6/19/2019
2	Description of Planning Area	Regional background and water quality for major watersheds	12/8/2021
3	TMACOG Water Quality Policies	Environmental policies of TMACOG and the 208 Plan (New chapter)	12/14/2022
4	Federal and State Laws and TMACOG Position Statements	Descriptions of State and federal laws as well as position statements from the Agenda for Lake Erie (Previous chapter 3 without any other changes)	12/14/2022
5	Public Wastewater Treatment	Facility planning areas, public sewerage systems, and sewage treatment needs	12/23/2025
6	On-Site Sewage Treatment	Package plants and individual sewage treatment devices	6/19/2019
7	Agriculture, Drainage, and Habitat	Non-point source pollution and best management practices for agriculture	6/20/2018
8	Stormwater Management	Non-point source pollution and best management practices for urban stormwater	12/8/2021
9	Public Drinking Water	New Chapter	2025

The 208 Plan is available at **https://tmacog.org/water/regional-water-quality-plan** after it is certified by the OEPA

This document was prepared by the TMACOG Water Quality Department staff with assistance from the regional Designated Management Agencies.

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Chapter 1: Areawide Overview

I. Introduction

The Clean Water Act was written in 1972, which prompted planning efforts to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Areawide agencies, such as the Toledo Metropolitan Area Council of Governments (TMACOG), were appointed by state Governors to develop and implement water quality management plans under Section 208 of the Act.

TMACOG's original Areawide Water Quality Management Plan (AWQMP) or 208 Plan was finalized in 1976. That plan was used to secure grants for the construction of waste treatment works under Section 201 of the Act through the 1980s. Major revisions were made in 2003 and aside from that, individual chapters of the plan have been updated as needed. Over time, water quality topics other than wastewater planning have been added, including efforts to control non-point source pollution and policy recommendations made by TMACOG members. A comprehensive, multi-year update began in 2022, with the goal of having a new plan framework and most content updated with the 2026 plan submittal (January 2027).

The TMACOG areawide region covers Lucas, Ottawa, Sandusky, and Wood Counties in Ohio, and Bedford, Erie, and Whiteford Townships of Monroe County, Michigan (Figure 1-1). In this region, there are 115 local governments, not counting Special Districts and Authorities, that proactively work to minimize their impacts on water quality. This plan is designed to capture water quality work that takes place throughout the region, to provide a large-scale overview and foster collaboration between separate entities. Current issues and recommended actions are being added or updated as part of the comprehensive update, creating a powerful planning tool that is accessible to water quality professionals and the public.

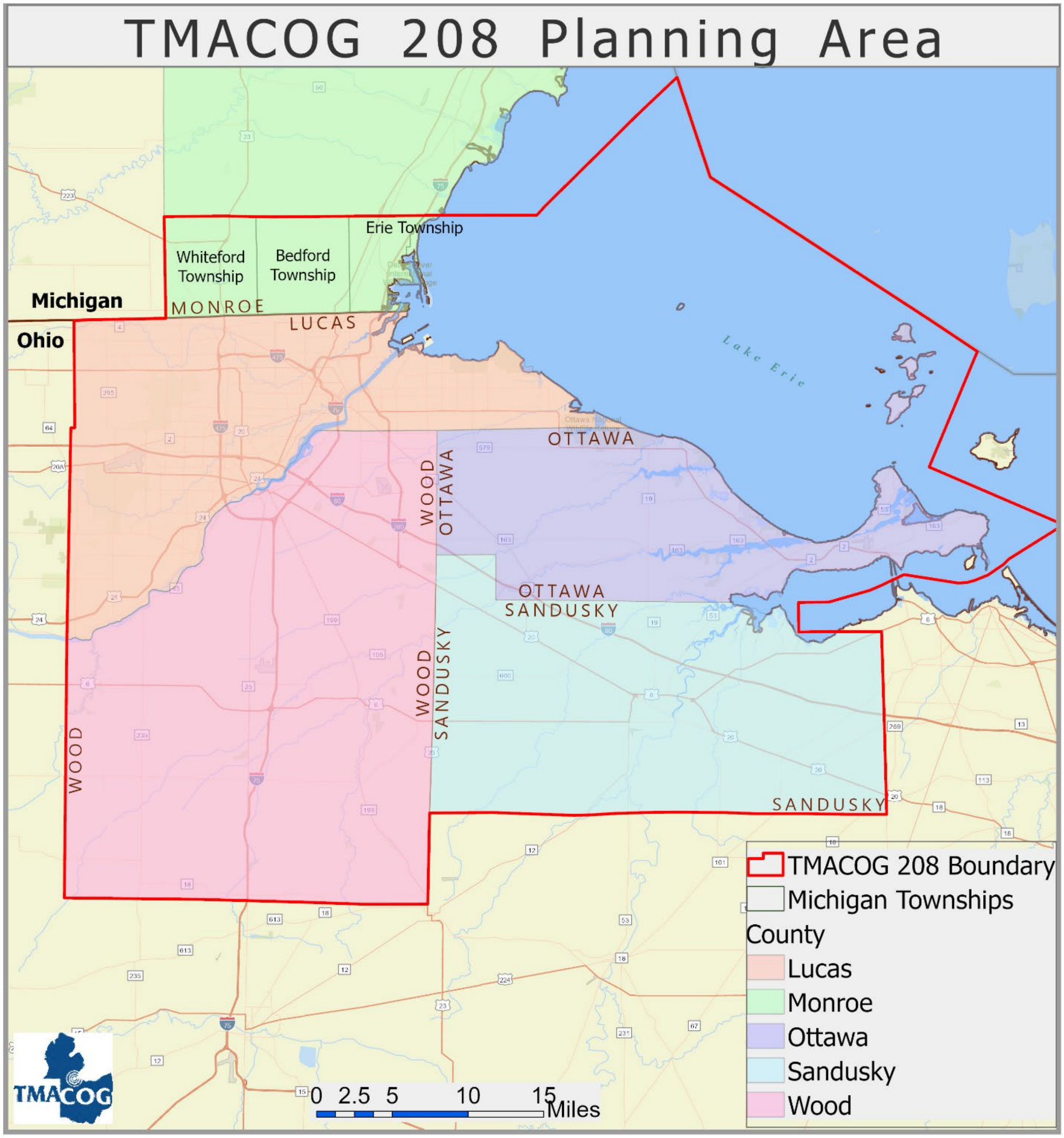

Figure 1 - 1 :TMACOG Areawide Planning Region

II. Legal Basis of the Areawide Water Quality Management Plan

The Clean Water Act sets Water Quality Management Plan (WQMP) requirements for both states and Areawide Agencies. Section 208 of the Act describes the requirements for Areawide plans, and Section 303(e) describes the state requirements. The state's WQMP incorporates all the Areawide plans. After amendments to an Areawide plan have been adopted by the TMACOG Board of Trustees, they go onto the State agency for certification and inclusion in the State plan. TMACOG's original AWQMP was certified by Michigan Governor William G. Millken on January 9, 1980, and by Ohio Governor James A. Rhodes on May 4, 1981. The plan was most recently certified by Ohio Governor John Kasich on April 6, 2016.

Current U.S. Environmental Protection Agency (USEPA) regulations require fundamentally the same elements but are less rigid about which are prepared by the State and which by the Areawide. The regulation, 40 Code of Federal Regulations (CFR) 130.6: Water Quality Management Plans, is summarized below:

A) Water Quality Management Plans: WQMPs consist of initial plans and certified updates. Continuing water quality planning shall be based upon WQMPs and water quality problems identified in the latest 305(b) reports. State water quality planning should focus annually on priority issues and geographic areas and on the development of water quality controls leading to implementation measures.

B) Use of WQMPs: These plans are used to direct implementation. WQMPs draw upon the water quality assessments to identify priority point and nonpoint water quality problems, consider alternative solutions and recommend control measures, including the financial and institutional measures necessary for implementing recommended solutions. State annual work programs shall be based upon the priority issues identified in the State's WQMP.

C) WQMP elements: The following elements shall be included in the WQMP. Some elements are part of Areawide Plans while others are covered by the State Plan.

- Total maximum daily loads (State WQMP).
- Effluent limitations (State WQMP).
- Municipal and industrial waste treatment. Identification of anticipated municipal and industrial waste treatment works, including combined sewer overflows (Areawide WQMP).
- Nonpoint source management and control (Areawide WQMP).
- Management agencies. Identification of agencies necessary to carry out the plan and provision for adequate authority for intergovernmental cooperation. Management agencies must demonstrate the legal, institutional, managerial and financial capability and specific activities necessary to carry out their responsibilities (Areawide WQMP).
- Implementation measures. Identification of implementation measures necessary to carry out the plan (Areawide WQMP).
- Dredge or fill program. Identification and development of programs for the control of dredge or fill material (State WQMP).
- Basin plans. Identification of any relationship to applicable basin plans developed under

section 209 of the Act (State WQMP).

- Ground water. Identification and development of programs for control of groundwater pollution (State WQMP).

D) Update and certification: State and/or Areawide agency WQM plans shall be updated as needed to reflect changing water quality conditions, the results of implementation actions, new requirements or to remove conditions in prior conditional or partial plan approvals.

E) Consistency: Construction grant and permit decisions must be made in accordance with certified WQM plans as described in the 40 CFR 130.12(a) and 130.12(b). In addition, Ohio law provides that permit decisions must be made in accordance with adopted WQM plans. The Ohio Revised Code (ORC) specifies this requirement:

6111.03(J)(2) An application for a permit or renewal thereof shall be denied if any of the following applies:

... (b) The director determines that the proposed discharge or source would conflict with an areawide waste treatment management plan adopted in accordance with section 208 of the Federal Water Pollution Control Act;...

III. Plan Amendments

Maintaining the AWQMP is necessary to keep it relevant for local and regional needs, including:

- Wastewater treatment facility needs (**Chapter 5**) change as communities replace or upgrade their systems and provide service to new areas.
- Critical Sewage Areas (**Chapter 6**) change, as designated by local Health Districts, when stream or septic system testing indicates new areas, or when a sewer extension eliminates the problems.

The TMACOG Water Quality Council is the forum for review of AWQMP amendments. Amendment requests may be made by members of the Water Quality Council or Designated Management Agencies (DMAs). The Water Quality Council makes recommendations on Plan amendments to the TMACOG Board of Trustees, which adopts the Plan. When all or part of the Plan is amended by the TMACOG Board of Trustees, the new version supersedes all previous versions of that part of the Plan. After adoption by the Board of Trustees, the Plan is submitted to the Governors of Ohio and Michigan for Certification.

Chapter 2: Description of Planning Area

I. Regional Population

A direct result of population is the volume of wastewater generated through private, commercial, or industrial activities. Areawide Water Quality Management Plans (AWQMPs) were developed in the mid-1970s to focus on long-term wastewater treatment planning. The TMACOG region includes Lucas, Ottawa, Sandusky, and Wood Counties in Ohio and Bedford, Erie, and Whiteford Townships in Monroe County Michigan. Since 1970, there has been a major decline in the population of Lucas County while Wood County has grown, and Ottawa and Sandusky Counties have remained similar. Compared to the other counties, Lucas has the greatest population at more than 430,000, which includes the region's largest city, Toledo with a population of greater than 270,000 (Table 2-1). Aside from the decreasing population in the City of Toledo since 2010, and increasing population in Perrysburg, most of the cities in the region have remained the same. Among the three townships in Michigan, Bedford Township has the greatest population with more than 31,000.

Table 2 - 1 Population in TMACOG region

Jurisdiction	1970 Population	2010 Population	2020 Population	Cities	2010 Population	2020 Population
Lucas County	484,370	441,815	431,279	Maumee	14,286	13,896
				Oregon	20,291	19,950
				Sylvania	18,965	19,011
				Toledo	287,208	270,871
				Waterville	5,523	6,003
Ottawa County	37,099	41,428	40,364	Port Clinton	6,056	6,025
Sandusky County	60,983	60,944	58,896	Bellevue	8,202	8,249
				Clyde	6,325	6,294
				Fremont	16,734	15,930
Wood County	89,722	125,488	132,248	Bowling Green	30,028	30,808
				Fostoria	13,441	13,046
				Northwood	5,265	5,160
				Perrysburg	20,623	25,041
				Rossford	6,293	6,299
Bedford Township		31,085	31,813			
Erie Township		4,517	4,299			
Whiteford Township		4,602	4,590			
Total		**709,879**	**703,489**			

Sources: Decennial Census 1970, 2010, 2020

II. Physical Setting

Geology

The TMACOG planning area is located within the Huron-Erie Lake Plains physiographic region that once was the bottom of a much larger ancient lake known as Lake Maumee (Ohio DNR, 2018). The region is an extremely flat plain with sandy beach ridges and dunes in the western portion (known as the Oak Openings) and the remaining areas marked by rich black soils and poor drainage (formerly the Great Black Swamp). The underlying bedrock that consists of limestone, shales, and sandstone wither in outcrops or near the surface. The geological features for the area are illustrated in Figure (2-1).

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Figure 2 - 1: Geological Features in the TMACOG Region

Ecology

The last ice age to impact northwest Ohio and southeastern Michigan was the Wisconsin glaciation. As the glacier retreated, it left a flattened surface covered with impermeable clay. Lakes formed where water was trapped between the retreating ice and higher land to the west. As the water levels dropped, sand dunes formed along the beach ridges and dense forests developed in lower swampy areas. The swamp became known as the Great Black Swamp, which covered approximately 1,500 square miles in northwest Ohio (Figure 2-2). In 1859, Ohio legislature passed the Ditching Law, allowing county commissioners to construct drainage ditches. As a result, the swamp was rapidly drained and by 1900, most of the region was converted to agricultural land with few remaining swampy areas.

The region's single most important natural habitat area is the Oak Openings Region (OOR), bordering the former Great Black Swamp (Figure 2-2). Considered as "One of America's Last Great Places" by The Nature Conservancy, the OOR is a sandy five-mile-wide swath that stretches southwestward over 80 miles through Wayne and Monroe counties in Michigan and Lucas, Henry, Fulton and Wood counties in Ohio (Green Ribbon Initiative, 2016). The unique geology of the region supports globally rare plant communities, including oak savanna, tallgrass prairie, and wet prairie. Since the first rare plant list was created in 1980, Lucas County has led the state with more rare plant species than any other county in Ohio.

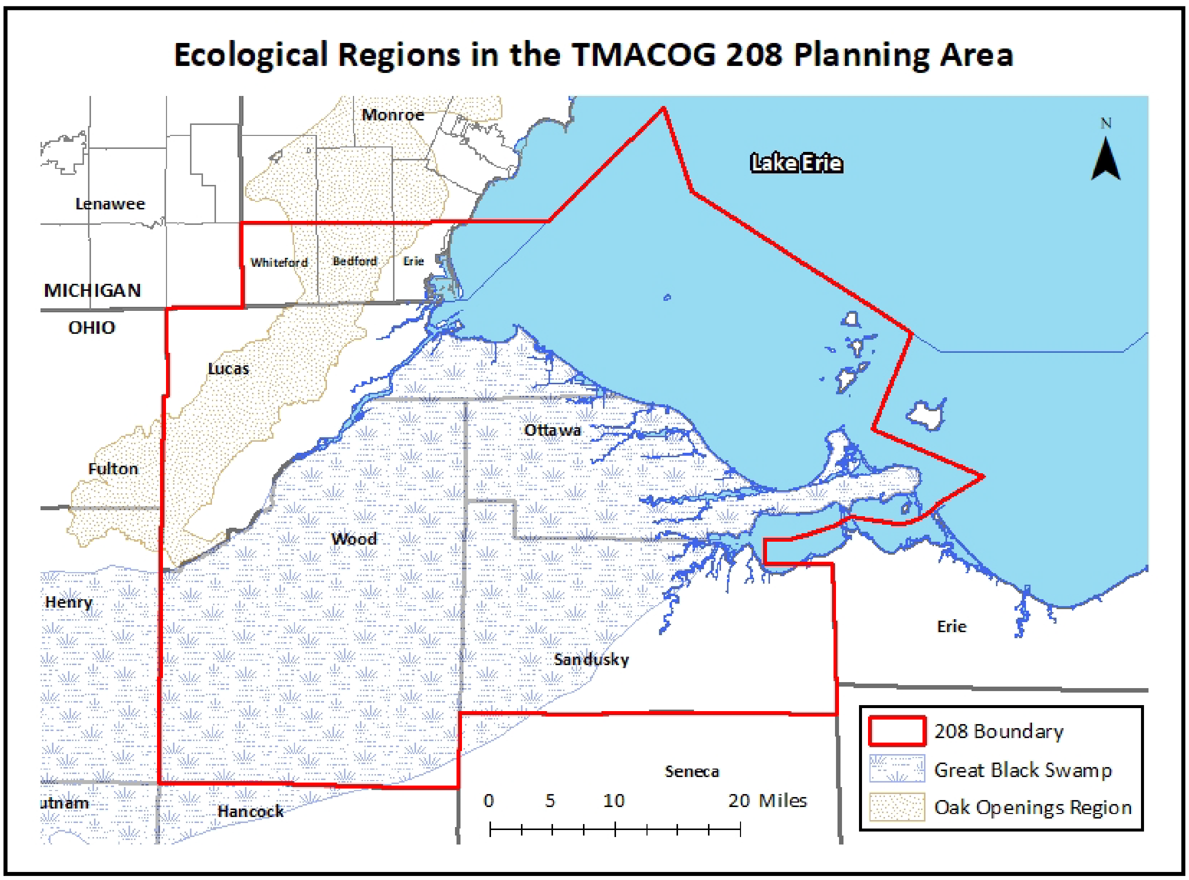

Figure 2 - 2: Ecological Regions in the TMACOG Region

Lake Erie

Lake Erie is one of Ohio's most valuable natural resources and is essential for economic development. The lake provides water for drinking and industry, shipping of commodities, commercial fishing, waterborne transportation, and recreation. It was estimated that total tourism annual spending exceeds $14 billion which helps support more than 120,000 jobs (Lake Erie Foundation 2018). Ultimately the purpose of this entire AWQMP is to protect Lake Erie and sustain the regional quality of life.

Lake Erie is the shallowest, smallest by volume, and most productive of the Great Lakes. Because it is the shallowest, it is also the warmest and is also the first lake to freeze in the winter. Because it is the smallest, it has the shortest retention time of 2.6 years. Despite being the smallest lake, its fish population accounts for an estimated 50% of all fish inhabiting the Great Lakes. Lake Erie is divided into eastern, central, and western basins. The Eastern Basin has an average depth of 80 feet and holds lake water 322 days. The Central Basin is the largest, with an average depth of 60 feet and a retention time of 635 days. The TMACOG region is on the Western Basin, which has an average depth of 24 feet and a retention time of 51 days (Bolsenga and Herdendorf, 1993).

Rivers and Watersheds

All drainage in the TMACOG region flows to western Lake Erie. The three primary rivers draining the region include the Maumee, Portage, and Sandusky.

Maumee River

The Maumee River is the largest Great Lakes tributary, draining all or part of 17 Ohio counties, two Michigan counties, and five Indiana counties. The total river basin covers 8,316 square miles**.** The Maumee mainstem begins in Fort Wayne, Indiana at the confluence of the St. Joseph and St. Mary's rivers then flows northeasterly through Defiance and Toledo, Ohio. Along the way the Maumee is joined by several major tributaries: Tiffin, Auglaize, and Blanchard Rivers. In Wood and Lucas Counties, several smaller streams flow into the Maumee: Beaver Creek and Tontogany Creek from the south, and Swan Creek in downtown Toledo. Most drainage flows through the tributaries, and then into the Maumee. The Maumee's gradient is 2.0 feet per mile from Grand Rapids in Wood County to Point Place near its mouth, with the steepest section between Waterville and Maumee, at 5.0 feet per mile (Forsyth, 1968).

Portage River

The Portage is a Black Swamp river, draining a large part of Wood County, smaller parts of Hancock, Ottawa, and Sandusky Counties, and a small area in Seneca County. The total river basin covers 581 square miles. The headwater streams are the only part of the basin with substantial fall, especially in Hancock County, in the Defiance Moraine. Most of the remaining areas of the basin are very flat and historically were covered with wet prairies and forests, and shallow lakes with little natural drainage. Settlement and farming were made possible only through draining the swamp and preventing floods. The headwater streams of Brush Creek, Yellow Creek, and West Creek originally flowed into the Portage North Branch but were cut off through the Jackson Cutoff Ditch in 1878-1879. Today the Jackson Cutoff Ditch flows into the Maumee River through Beaver Creek. In Oak Harbor, the Portage broadens into "Portage Pond," the lacustrine area. This lower reach is strongly influenced by Lake Erie and wind-driven seiche events. The highest headwater tributary is the East Branch, starting at 855 feet above sea level in Hancock County. The lowest headwater stream is the North Branch, starting at 700 feet above see level where it was cut off from Brush Creek in Wood County. The mainstem of the river is over 60 miles with gradient ranges from 2.1 to 4.7 feet per mile down to Lake Erie at 573 feet above sea level (Ohio DNR, 1965).

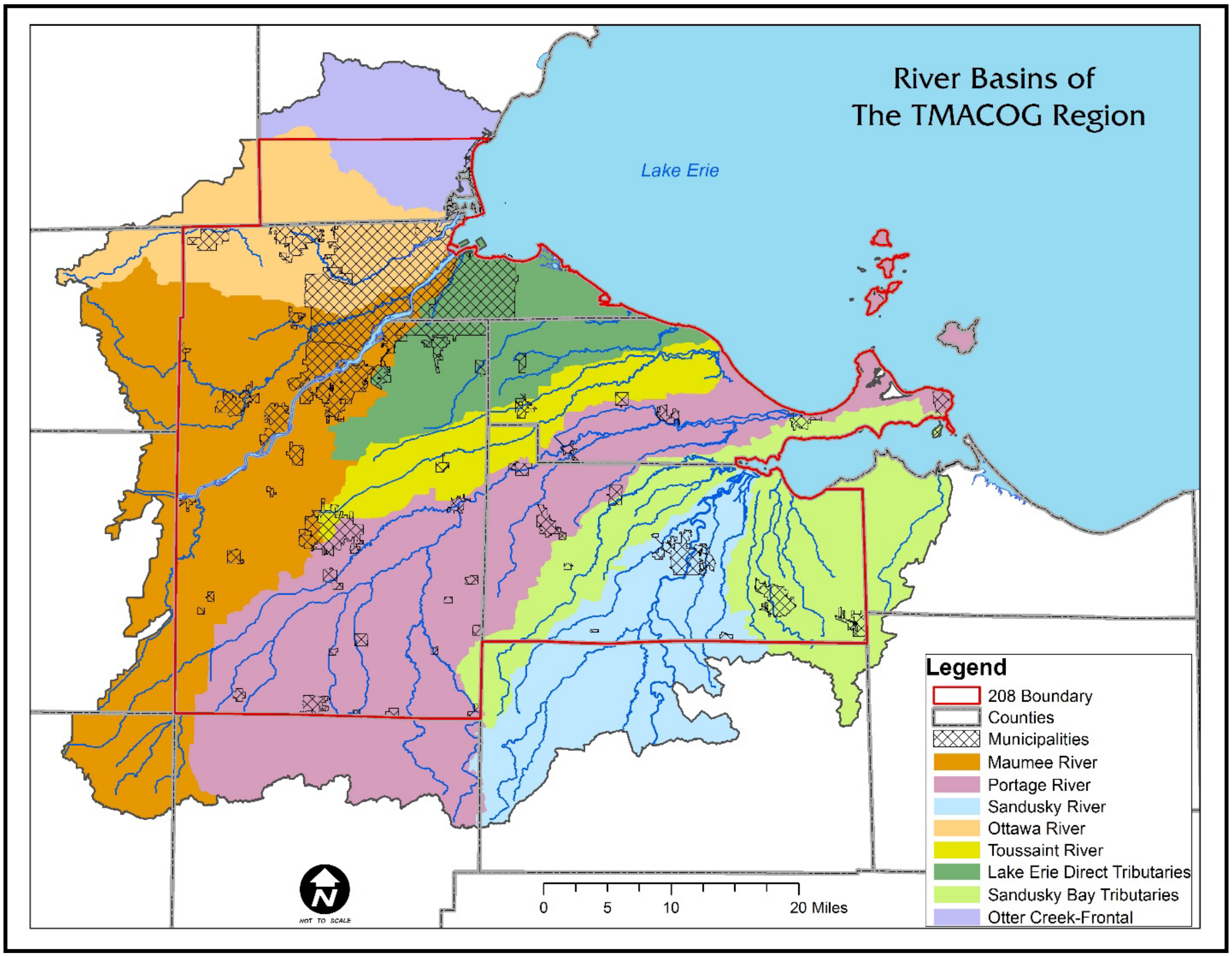

Figure 2 - 3: Major Watersheds of the TMACOG Region

Sandusky River

The Sandusky River is the second largest Ohio Lake Erie tributary with a drainage area of 1,421 square miles. The Sandusky drains parts of 10 counties, with the central part of the basin covering Sandusky, Seneca, Wyandot, and Crawford Counties. The Sandusky River basin is different geologically from the Maumee and Portage, in that only the lower portion of the river is in the Huron-Erie Lake Plains Eco-Region; the upper watershed has more relief from moraine deposits. Overall, the Sandusky has a gradient of 3.9 feet per mile from its headwaters to mouth at Sandusky Bay (Sandusky River Watershed Coalition, 2002). In the TMACOG region, the principle tributaries are Muskellunge Creek, which drains central Sandusky County; Wolf Creek, which flows northeast from Fostoria and joins the Sandusky in Ballville Township; and Bark Creek, which flows north through eastern Fremont and into the Sandusky near Wightman's Grove in Riley Township.

III. Designated Uses for Water in the Planning Area

Water Quality Standards

USEPA signed a final rule updating the federal water quality standards regulation which helps implement the Clean Water Act (CWA). The final rule was published in the Federal Register on August 21, 2015 (80 FR 51019) to replace the previous regulation that had been in place since 1983; it is available in the Code of Federal Regulations (CFR) Title 40: Protection of Environment, Part 131 – Water Quality Standards. States are responsible for reviewing, establishing, and revising water quality standards. As recognized by Section 510 of the CWA, States may develop water quality standards more stringent than required by the federal regulation. Ohio EPA's water quality standards were reorganized in February 2017 and are available in the Ohio Administrative Code 3745-1. Michigan's water quality standards were filed in January 2006 and are available in the State of Michigan's Part 4 Rules.

Water quality standards consist of two distinct elements: designated uses (USEPA, 2012) and numerical or narrative criteria (USEPA, 2017) designed to protect and measure attainment of the uses (Figure 2-4). The designated uses in the figure below represent examples; states may identify their own designated uses for monitoring the quality of water. For example, Ohio EPA addresses human health, recreation, aquatic life, and public drinking water supply; Michigan Department of Environment, Great Lakes, and Energy (EGLE) addresses navigation, industrial water supply, agriculture, aquatic life and wildlife, fish consumption, and body contact.

Designated Use	Description
Protection and propagation of fish, shellfish and wildlife	Coldwater fish, warmwater fish, shellfish, aquatic flora, waterfowl, shore birds, and other water-oriented wildlife
Recreation	Primary contact – swimming, water-skiing, skin-diving, surfing, other activities likely to result in immersion. Secondary contact – boating, wading, and rowing
Public drinking water supply	Waters that are the source for drinking water supplies and often includes waters for food processing
Agricultural, industrial, navigational and other purposes	Agricultural – waters that are suitable for irrigation of crops, consumption by livestock, support of vegetation for range grazing. Industrial – industrial cooling and process water supplies. Navigation – waters used for commerce

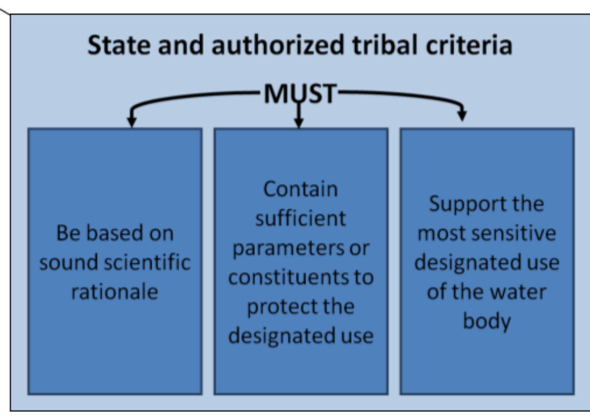

Figure 2 - 4: Water Designated Uses

Water quality criteria used to protect the specific designated uses include several parameters:

- Physical: temperature, acidity (pH), turbidity, and suspended solids.
- Chemical: dissolved oxygen, biochemical oxygen demand, electrical conductivity, nutrients (various forms of phosphorus and nitrogen), pesticides, metals (copper, lead, mercury, zinc, etc.), polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), and toxins.
- Biological: pathogens (*Escherichia coli*, total and fecal coliforms, etc.), index of biotic integrity (IBI), invertebrate community index (ICI), and cyanobacteria.
- Additional: physical habitat information (qualitative habitat evaluation index (QHEI)).

Integrated Report

State environmental agencies are required by the CWA to provide the USEPA with an assessment of the quality of the State's waters [Section 305(b)], a list of waters that do not support their designated uses or attain Water Quality Standards and require the development of Total Maximum Daily Loads (TMDLs) [Section 303(d)], and an assessment of status and trends of publicly owned lakes (Section 314). Ohio EPA and Michigan EGLE combine these reports as Integrated Reports, which are updated every two years. The main goal of the Integrated Report is to describe the attainment status of surface waters at the watershed scale relative to the uses specified by the State environmental agency.

The current reports for Ohio and Michigan are:

- The Ohio EPA 2020 Integrated Water Quality Monitoring and Assessment Report

The Water Quality and Pollution Control in Michigan 2020 Sections 303(d), 305(b), and 314 Integrated Report *Lake Erie*

The Western Lake Erie Basin (WLEB) extends from the Ohio – Michigan shorelines to Marblehead and is bordered to the north by Canada (Figure 2-5). Ohio EPA divides the western's basin into shoreline and open water. The shoreline area is defined as the portion that extends out to and including a depth of three meters from the shore; the open water is the area in Ohio beyond three meters. Lake Erie islands shoreline includes South Bass Island, Middle Bass Island, North Bass Island, Kelleys Island, West Sister Island, and other small islands) (Ohio EPA, 2018).

In 2016, Michigan EGLE announced its designation of the Michigan waters of Lake Erie as impaired to due to excessive levels of phosphorus that promotes algal blooms which adversely impact aquatic life and other wildlife (Michigan EGLE, 2016). In 2018, Michigan EGLE similarly declared Lake Erie impaired for public drinking water used. In 2016, Ohio EPA assessed the shoreline area of the WLEB and identified all four beneficial uses (aquatic life, recreation, human health, and public drinking water) as impaired (Ohio EPA, 2016). Ohio EPA's position on the assessment and designation of Lake Erie's open waters had been that since they are multi-jurisdictional and multi-national, that USEPA should take the lead on setting targets and assessment methods. However, there had been no progress establishing federal targets for the lake, so Ohio EPA proceeded with considerable aid of several universities and NOAA, to develop a method for assessing the open waters. The 2020 Ohio Integrated report released long-awaited public drinking water and recreational use impairment designations for the open waters of the WLEB. The full list of impairment designations made by the Ohio EPA in 2018 for the Lake Erie assessment units are shown in Table 2-2 that correlates with Figure 2-5 (Ohio EPA, 2020). With the release of the 2020 Ohio Integrated Report, Ohio EPA announced that it will develop a Maumee nutrient TMDL within two to three years, a process it began in 2021.

Table 2 - 2: Impairment designations for the western Lake Erie basin.

Assessment Unit Name	Recreational Use	Public Drinking Water	Human Health Use	Aquatic Life Use
Lake Erie Islands Shoreline	Impaired; TMDL needed	Impaired; TMDL needed	Impaired; TMDL needed	Impaired; TMDL needed
Western Basin Shoreline	Impaired; TMDL needed	Impaired; TMDL needed	Impaired; TMDL needed	Impaired; TMDL needed
Sandusky Basin Shoreline	Impaired; TMDL needed	Impaired; TMDL needed	Impaired; TMDL needed	Impaired; TMDL needed
Western Basin Onshore Areas				
Sandusky Basin Onshore Areas				
Western Basin Open Water	Impaired; TMDL needed	Impaired; TMDL needed	Impaired; TMDL needed	Use attainment unknown
Sandusky Basin Open Water	Use attaining	Impaired; TMDL needed	Impaired; TMDL needed	Use attainment unknown

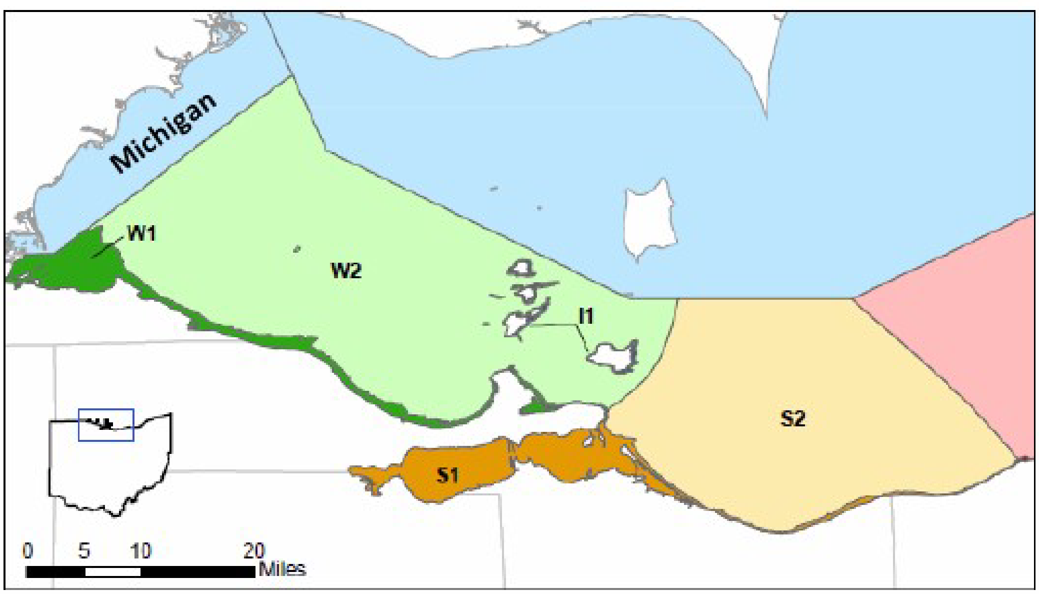

Figure 2 - 5: Lake Erie Assessment Units. W1 – Western Basin Shoreline (≤3m); W2 – Western Basin Open Water (>3m); I1 – Islands Shoreline (≤3m); S1 – Sandusky Basin Shoreline (≤3m); S2 – Sandusky Basin Open Water (>3m).

Details for all the HUC 12 watersheds and their use assessments in the TMACOG region are provided in Appendix A. The following figures summarize the watershed attainment status for Public Drinking Water Supply, Recreational Use, Human Health Use, and Aquatic Life Use. Appendix A and the figures below were developed using data from Ohio's 2018 Integrated Report and Michigan EGLE's 2016 Integrated Report. All data and maps will be fully updated with 2020 data from the Ohio and Michigan integrated reports in the 2021 208 Plan update.

Public Drinking Water Supply

Figure 2-6 shows water quality attainment for the public drinking water supply use designation. Several municipalities in Sandusky County, central and southern Wood County and western Lucas County draw water from streams and use offline reservoirs. Most of the watersheds in the TMACOG region are not assessed for this designated use because there are no public water supplies in these watersheds. In Ohio, the bodies with one or more the following characteristics are designated public water supply:

- All publicly owned lakes and reservoirs, except for Piedmont reservoir;
- All privately owned lakes and reservoirs used as a source of public drinking water;
- All surface waters within 500 yards of an existing public water supply surface water intake;
- All surface waters used as emergency water supplies

Ohio's water quality standards for Public Drinking Water Supply are detailed in Section H of the Integrated Report. No data are available from the Michigan EGLE Integrated Report.

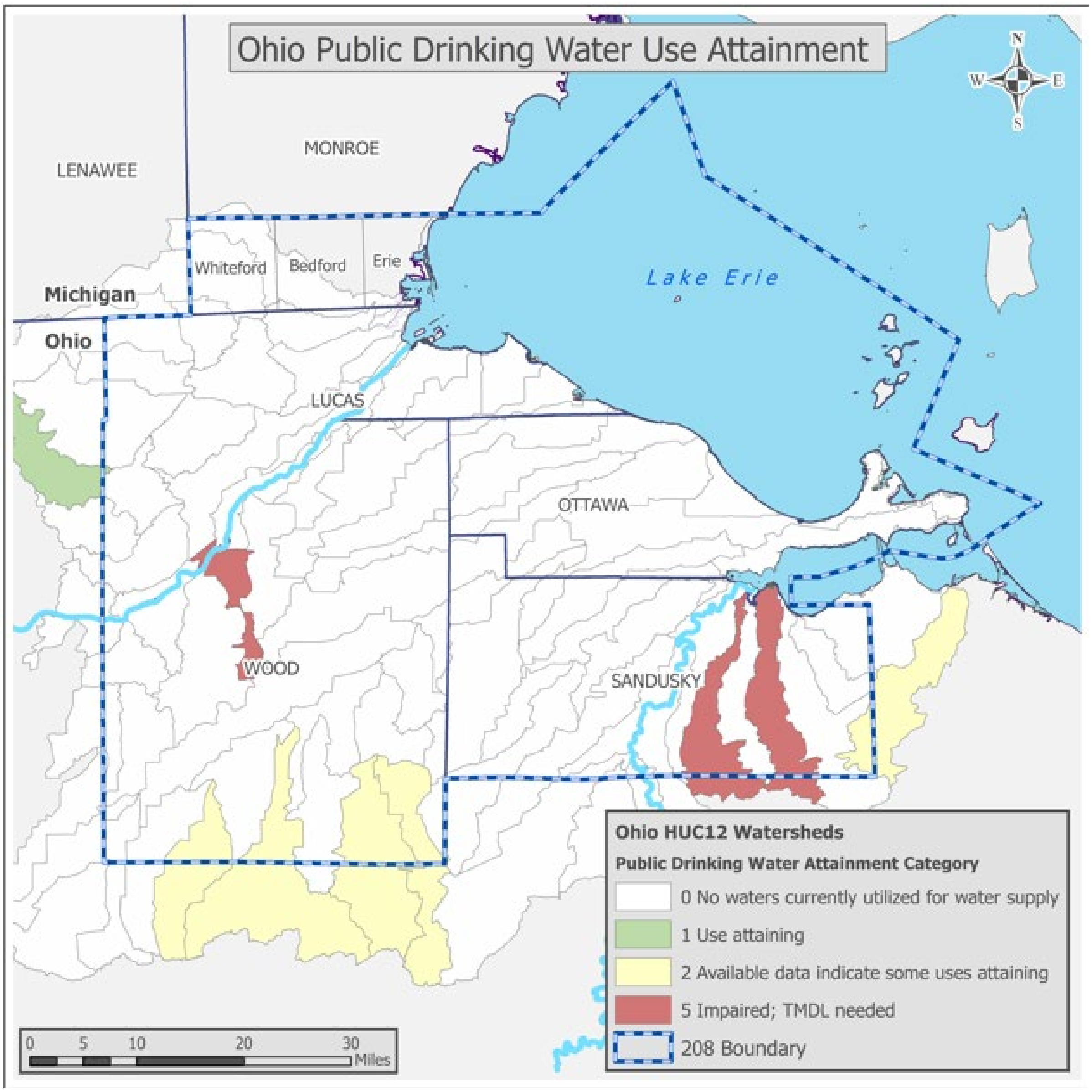

Figure 2 - 6: Watershed Use Attainment for Public Drinking Water Supply

Recreational Use

Figure 2-7 shows water quality attainment for the recreational use designation. Watershed use attainment for recreation is based principally on bacterial contamination, which is measured by the levels of *Escherichia coli* in the water. Most of the watersheds in the region are impaired for recreational use with only a few in attainment.

Ohio's water quality standards for Recreational Use are detailed in Section F of the Integrated Report. Michigan's water quality standards for Recreational Use are provided in Chapter 4 Section 4.7 of the Integrated Report.

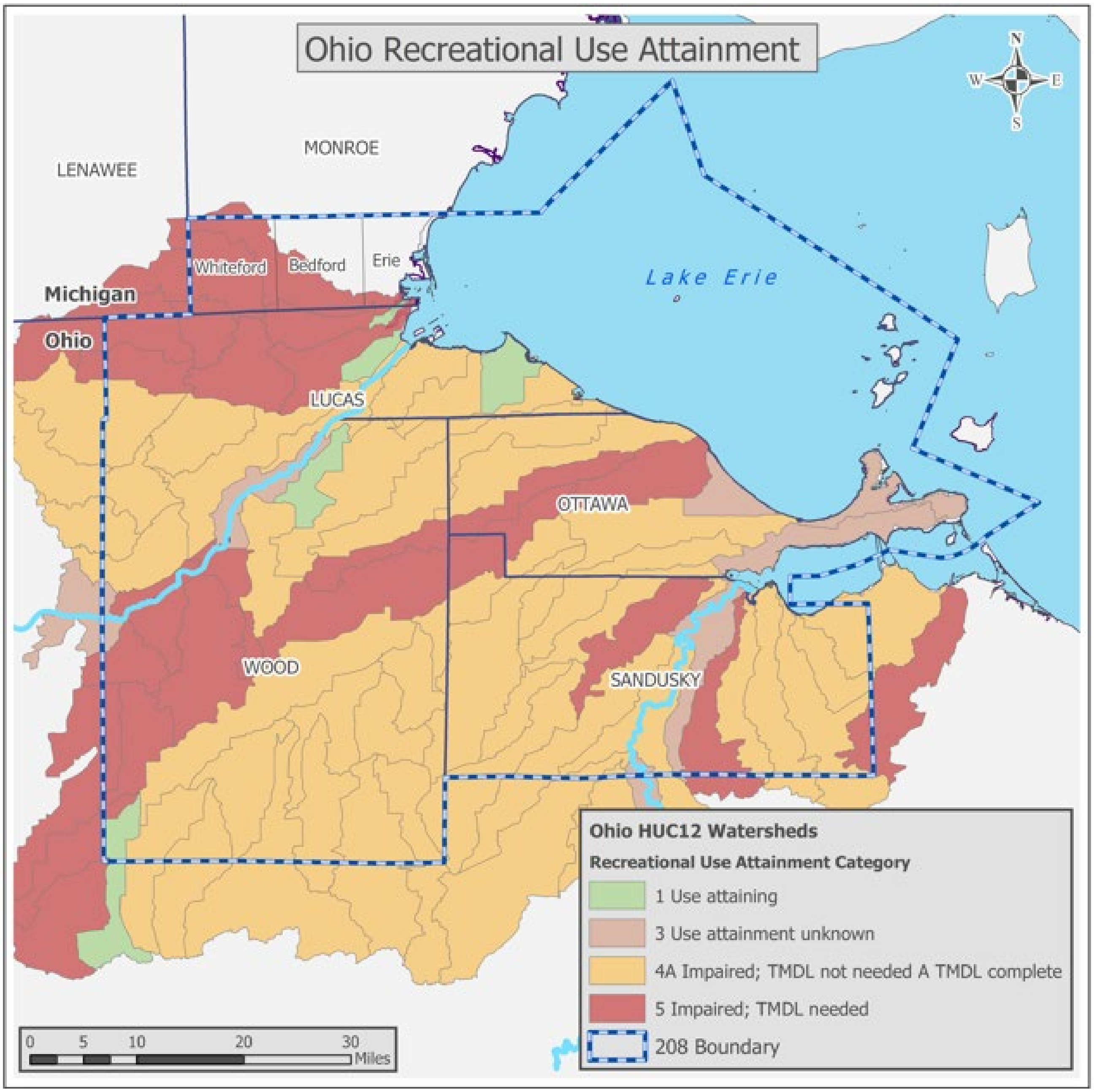

Figure 2 - 7: Watershed Use Attainment for Recreational Use

Human Health Use

Figure 2-8 shows water quality attainment for the human health use designation. Human health use attainment for a watershed is based on potential public exposure to carcinogenic and non-carcinogenic chemicals due to exposure via drinking water and exposure from contaminated flesh of sport fish. Chemicals of concern include PCBs, mercury, DDT, chlordane, hexachlorobenzene, and mirex. A Fish Consumption Advisory (FCA) is determined based on the quantity of a chemical in fish, such as micrograms of chemical per kilogram of fish tissue (µg/kg). The Human Health Use designation is unknown for most of the watersheds in the region is unknown. Approximately one third of the watershed area of the region is impaired with respect to human health, and nearly all of these watersheds the chemical of concern is PCBs.

Section E of Ohio's 2018 Integrated Report lists which contaminants were found in each impaired watershed. Michigan's water quality standards are provided in Chapters 5 (Great Lakes), 6 (Inland Lakes and Reservoirs), and 7 (Rivers) of the Integrated Report.

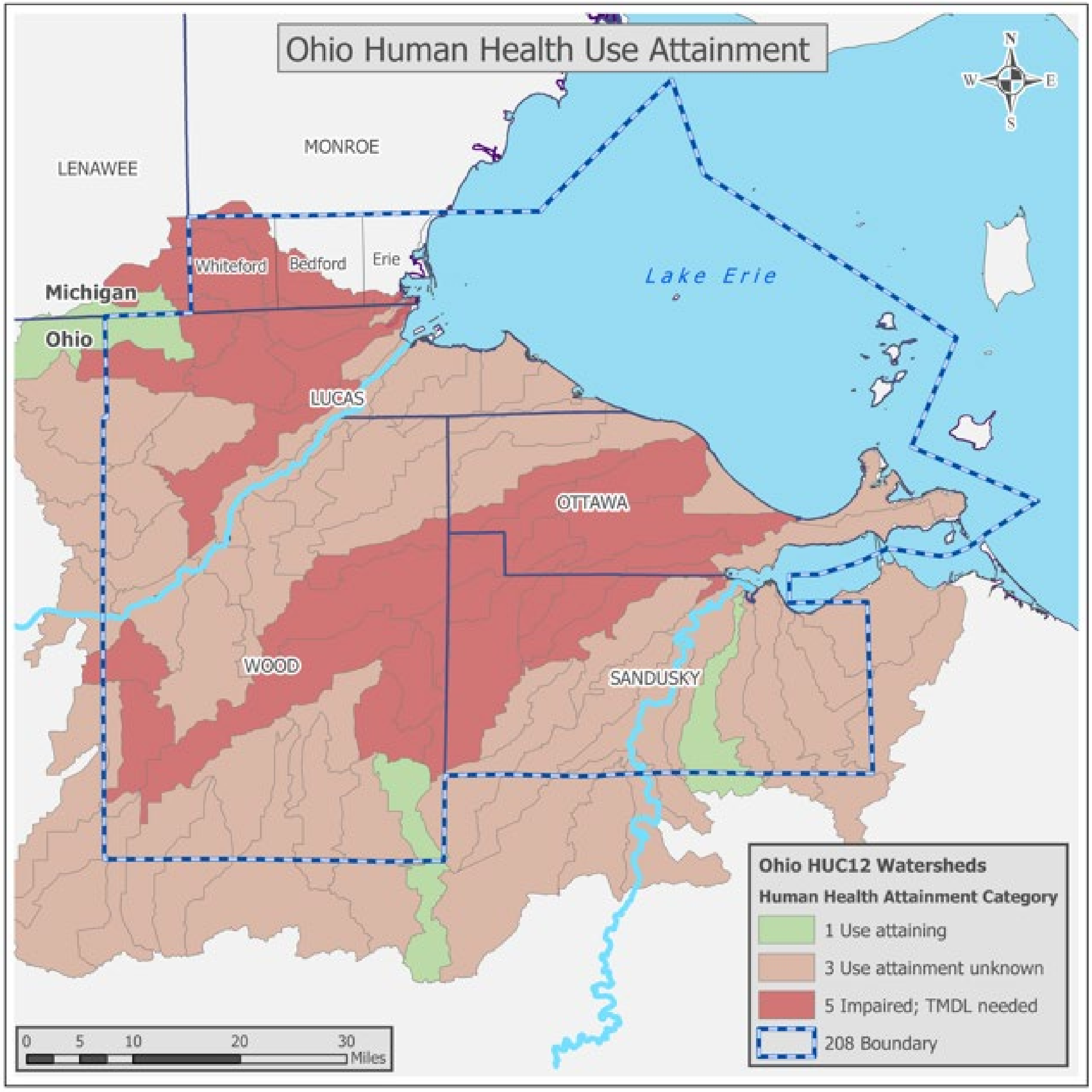

Figure 2 - 8: Watershed Use Attainment for Human Health Use

Aquatic Life Use

Figure 2-9 shows water quality attainment for the aquatic life use designation. Aquatic life rates a watershed's ability to provide habitat and support fish and macroinvertebrates (e.g., insect larvae, crustaceans, mollusks, worms, and other organisms at the base of the food chain). More than the other use attainment categories, aquatic life is dependent on the land draining into the stream. Use attainment is based on biological and chemical data from water samples and surveys conducted instream to determine the number of organisms, the number and diversity of species, and whether those species are pollution sensitive or pollution tolerant. More than half of the region's watershed area is impaired with respect to aquatic life, with the top five causes of impairment due to: siltation/sediment, nutrients, habitat modification, hydromodification, and organic enrichment / dissolved oxygen (DO).

Ohio's water quality standards for Aquatic Life Use are detailed in Section G of the Integrated Report. Michigan's water quality standards are provided in Chapter 4 Sections 4.5 and 4.6 of the Integrated Report.

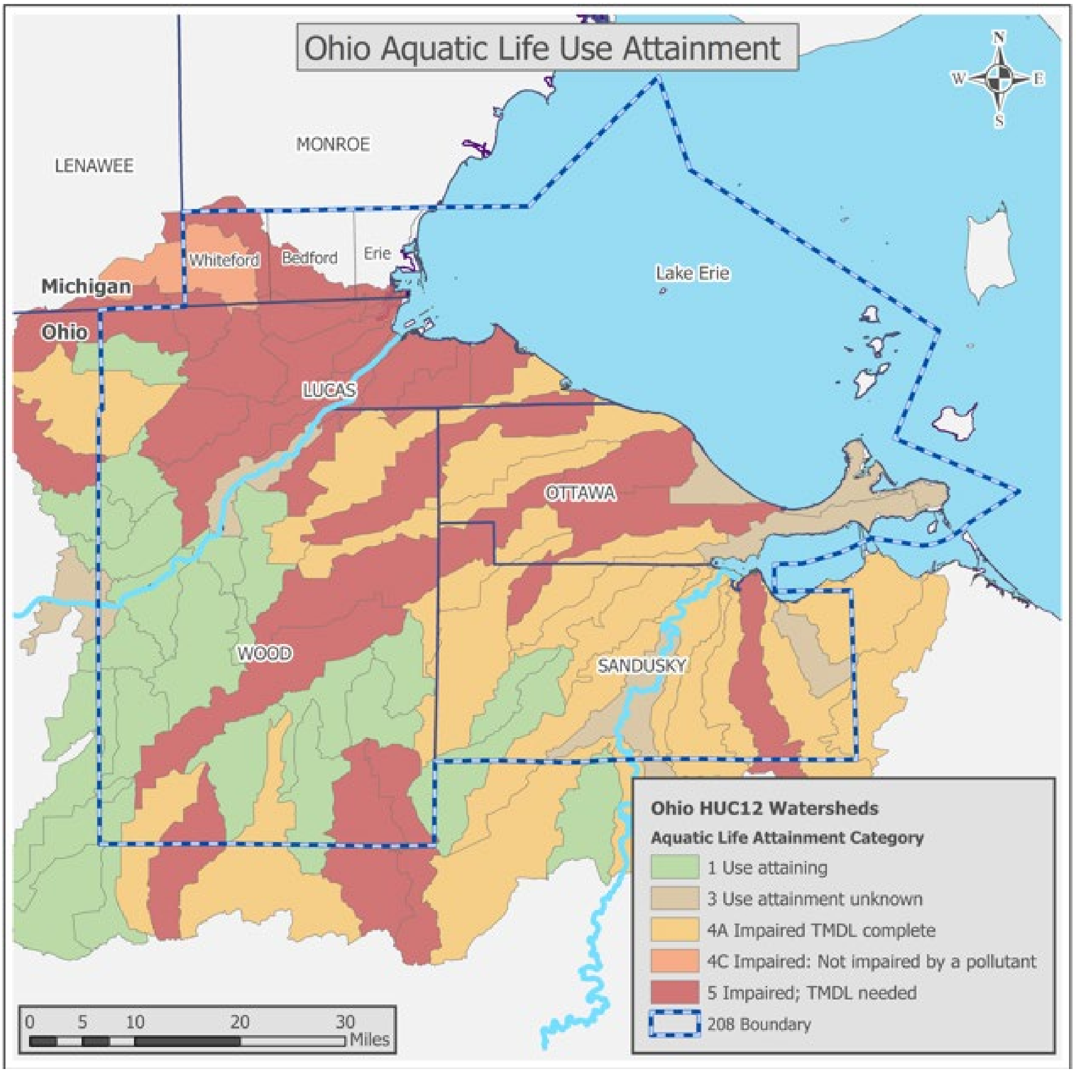

Figure 2 - 9: Watershed Use Attainment for Aquatic Life

Beneficial Uses in Michigan

Michigan EGLE assesses use attainment and reports the results of these assessments differently from Ohio EPA. Due to the inability to align the two assessment methods between Ohio and Michigan, the most recent available data for use attainments in Michigan watersheds are presented as table A-3 in appendix A. and the use attainment maps (Figures 2-6 through 2-9) only include watersheds assessed by Ohio EPA.

Total Maximum Daily Loads

Under Section 303(d) of the Clean Water Act, individual States or the USEPA, conduct the Total Maximum Daily Load (TMDL) program for waters that have identified as impaired. The program focuses on identifying and restoring polluted rivers, streams, lakes and other surface water bodies. The TMDL establishes the maximum amount of a pollutant allowed in a waterbody and serves as the starting point or planning tool for restoring water quality and fully obtaining the designated uses. Both Ohio EPA and Michigan EGLE conduct TMDLs.

Table 2 - 3: The progress for TMDLs in the TMACOG region as of July 2022

Water Body	TMDLs Progress
Toussaint River	Approved
Portage River	Approved
Swan Creek	Approved
Lower Maumee River Tributaries and Lake Erie Direct Tributaries	Approved
Maumee River Main Stem	Uder development
Sandusky River	Approved
Ottawa River	under development
Lake Erie Luna Pier Beach	Approved
LaPointe Drain	Approved
River Raisin	Approved
Wagner-Pink Drain	Approved
Maumee Watershed Nutrient TMDL	Approved

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Chapter 3: TMACOG Water Quality Policies

Section 1 - Overview of Water Quality Management Planning

Water Quality Management (WQM) Planning in Ohio integrates community development planning, natural resource conservation, and public facility planning. Successful WQM planning enables Ohio communities to grow and prosper while maintaining high quality water resources for recreation and life. As an "Areawide Agency" designated Section 208 of the Clean Water Act, the Toledo Metropolitan Area Council of Governments (TMACOG) has responsibilities for WQM planning within a specific area – Lucas, Wood, Ottawa, and Sandusky Counties in Ohio and Erie, Whiteford, and Bedford Townships and the City of Luna Pier in Monroe County, Michigan. TMACOG's Areawide Water Quality Management Plan (AWQMP or "208 Plan") reflects the priorities of management agencies and local governments in TMACOG's planning region. This Chapter describes the rules and responsibilities for WQM planning established by the Federal and State governments and lists regional policies developed by a consensus of Designated Management Agencies (DMAs) and TMACOG members to set rules for regional wastewater treatment.

In 2022, all AWQMP decision-making policies and strategies driving the planning process were consolidated into one chapter – *Chapter 3: TMACOG Water Quality Policies*. This Chapter is intended to provide clear direction to landowners, developers, and local governments as they plan for construction and future land development. The creation of this chapter in 2022 includes the policies contained within the TMACOG AWQMP approved by the TMACOG Board of Trustees in 2021. As TMACOG members and DMAs work to update the AWQMP, policies will be added, revised, or removed through TMACOG's consensus-based process.

Section 2 - Purpose and Use of AWQMP Policies

2.1 - Decision-making Policies

The AWQMP policies listed in Section 4 of this chapter reflect the decisions by DMAs and TMACOG members for how water pollution is to be prevented, reduced, mitigated, treated, or managed in the TMACOG region. These policies, used in concert with map data define what options will be available to treat sanitary waste, where sanitary sewers may be extended in the future, what publicly owned treatment plant will treat wastewater, and under what conditions on-site sanitary systems are allowed. Below is a summary of the intended use of the policies listed in Section 4. Section 6 describes the process for AWQMP dispute resolution.

2.1.1 Authority of the TMACOG AWQMP Plan

i. TMACOG staff and DMAs review requests to Ohio EPA for permits to install new sewerage infrastructure through the NPDES permitting system to ensure that plans are consistent with the TMACOG AWQMP. The TMACOG AWQMP and associated map data are the authoritative source of information guiding this decision-making. The authority of the AWQMP is established in the Clean Water Act and the Ohio Revised Code –
    a. The CWA requires that "no NPDES permit may be issued which is in conflict with an approved Water Quality Management (WQM) plan." (40 CFR 130.12(a))

b. Ohio law provides that permit decisions must be made in accordance with adopted WQM plans. The Ohio Revised Code Section 6111.03(J)(2) specifies that – "An application for a permit or renewal thereof shall be denied if …(b) The director determines that the proposed discharge or source would conflict with an areawide waste treatment management plan adopted in accordance with section 208 of the Federal Water Pollution Control Act;..."

ii. Allocation of funds – CWA also establishes the purpose of the AWQMP in awarding certain grants for wastewater infrastructure - "… section 201 construction grant funds may be awarded only to those agencies for construction of treatment works in conformity with the approved WQM plan" (40 CFR 130.12(b). TMACOG does not conduct consistency reviews for 201 grant applications.

iii. Dispute resolution – The TMACOG AWQMP and its associated map data are the authoritative source of information in resolving disputes between management agencies. Cases that cannot be resolved through the AWQMP, decisions are made through the TMACOG Board of Trustees as described in Section 6 of this chapter.

iv. Litigation – For disputes that are resolved through litigation, the TMACOG AWQMP and its associated map data are the authoritative source of information in communicating regional priorities.

2.2 - Policies Related to the AWQMP Planning Process

The policies listed in Section 5 of this chapter define the processes for AWQMP development, plan amendments, identification of critical areas. These policies influence the administration of the AWQMP, but do not play a role in processes for permit issuance or development decisions. This section includes planning-related policies from all chapters of the AWQMP. Where needed for clarity, additional information has been added.

Section 3 - Authority and Responsibilities under the Clean Water Act

The Clean Water Act sets Water Quality Management Plan (WQMP) requirements for both states and Areawide Agencies. Section 208 of the Act describes the requirements for Areawide plans, and Section 303(e) describes the state requirements. The state's WQMP incorporates all the Areawide plans. After amendments to the 208 Plan have been adopted by the TMACOG Board of Trustees, the plan is then sent to the Ohio EPA, Michigan EGLE, and USEPA for certification and inclusion in the State WQMPs. The TMACOG AWQMP is updated annually or as needed. TMACOG's original AWQMP was certified by Michigan's Governor on January 9, 1980, and by Ohio's Governor on May 4, 1981. The TMACOG AWQMP was most recently certified by Ohio Governor Mike DeWine in 2020.

WQMPs consist of initial plans and certified updates with ongoing planning based on WQMPs and water quality problems identified in the latest 305(b) reports. State-level water quality planning should focus annually on priority issues and geographic areas and on the development of water quality controls leading to implementation measures.

WQMPs are used to direct implementation. WQMPs draw upon the water quality assessments to identify priority point and nonpoint water quality problems, consider alternative solutions and recommend control measures, including the financial and institutional measures necessary for implementing recommended solutions. State annual work programs should be based upon the priority issues identified in the State's WQMP.

Indian Tribes are eligible to carry out functions of water quality management planning for areas under their legal jurisdiction.

State and/or Areawide agency WQM plans must be updated as needed to reflect changing water quality conditions, the results of implementation actions, new requirements or to remove conditions in prior conditional or partial plan approvals.

3.1 - State and Areawide Planning Roles and Responsibilities

There are planning programs for publicly-owned wastewater treatment services at the State level and at the Areawide level. State programs are carried by Ohio EPA and Michigan EGLE, while TMACOG is the designated Areawide agency to coordinate local wastewater planning through the TMACOG AWQMP.

State Level Planning: The States were given several planning responsibilities under the CWA.

1. The identification of relationship, linkages and strategies for programs authorized by the CWA, the Resource Conservation and Recovery Act and the Safe Drinking Water Act;
2. Construction Grant and Revolving Loan Fund management;
3. Administration of the permits programs;
4. Water quality management planning and certification;
5. Water quality standards development, review and revision;
6. Enforcement, including compliance assurance activities.

Areawide Water Quality Planning: Areawide agencies like TMACOG were given regional planning responsibilities under the CWA.

1. Develop a comprehensive program(s) for the collection and treatment of water and for controlling water pollution from all point and nonpoint sources.
2. Establish and maintain an areawide policy decision-making forum to oversee implementation of the 208 Areawide plan and resolve conflict that may arise among participants in the 208 Areawide plan.
3. Implement changes in the *Areawide Water Quality Management Plan* following the amendment process defined in this chapter.

Table 3-1 is a summary of the required elements for WQMPs as described in the 40 Code of Federal Regulations (CFR) 130.6. Some elements are developed and updated as part of Areawide Plans while others are covered by the State Plan.

Table 3 - 1 - Responsibility for Water Quality Management Planning

WQMP Elements	Planning Responsibility
Total maximum daily loads	State WQMP
Effluent limitations	State WQMP
Municipal and industrial waste treatment. Identification of anticipated municipal and industrial waste treatment works, including combined sewer overflows	Areawide WQMP
Nonpoint source (NPS) management and control • Best Management Practices (BMPs) which the agency has selected as the means to control NPS pollution where necessary to protect or achieve approved water uses	Areawide WQMP
• NPS Regulatory Programs must be identified where they are determined to be necessary by the State to attain or maintain an approved water use or where non-regulatory approaches are inappropriate in accomplishing that objective.	State WQMP
Management agencies that carry out the plan must be identified. Management agencies must demonstrate the legal, institutional, managerial and financial capability and specific activities necessary to carry out their responsibilities. The TMACOG AWQMP refers to these agencies as designated management agencies (DMAs)	Areawide WQMP
Implementation measures necessary to carry out the plan must be identified	Areawide WQMP
Dredge or fill program. Identification and development of programs for the control of dredge or fill material	State WQMP
Basin plans. Identification of any relationship to applicable basin plans developed under section 209 of the Act	State WQMP
Ground water. Identification and development of programs for control of groundwater pollution	State WQMP

3.1.1 Designated management agencies (DMAs) responsibilities

The Clean Water Act calls for local jurisdictions and agencies to carry out specific roles in protecting water quality. Agencies with specific responsibilities in implementing the Clean Water Act are called Designated management Agencies (DMAs). DMAs are the entities responsible for managing wastewater infrastructure and planning for individual wastewater service areas called Facility Planning Areas (FPAs). These may cover a municipality and surrounding developed areas, or areas where public wastewater treatment may be provided more economically or more effectively at a regional level than for each individual political jurisdiction. FPAs provide individual jurisdictions with a means of planning and cooperation to provide TMACOG Areawide Water Quality Management “208” Plan service to residents. In *Chapter 5: Public Wastewater Treatment* each FPA in the Planning Region has an individual overview description including sewer service areas, future needs, and infrastructure improvement projects, which DMAs review for updates. The DMAs recognized by this Plan were established starting in the late 1970s, with DMA resolutions adopted by the elected officials, and cooperation agreements signed with TMACOG. DMAs accept responsibility to implement their part of the Clean Water Act, and thereby protect the region’s water quality.

Depending on its assigned role, a local DMA recognized by this plan must have the capability to:

- Have legal authority to provide service to its designated area
- Carry out its assigned portion of the AWQMP
- Accept and utilize grants or other funds from any source for waste treatment management or nonpoint source control purposes
- Raise revenues or other necessary funding, to implement its assigned portion of the Plan. Needed revenues may include staff funding, or for DMAs that own or operate sewage systems, assessments of waste treatment charges
- Incur short and long-term indebtedness
- Cooperate with and assist the TMACOG Water Quality Council in the performance of its Plan responsibilities and the Plan Amendment and updating process.

Several other DMA roles are specific to those that own and/or operate sewage facilities:

- Refuse to receive any wastes from a municipality, or subdivision thereof, which does not comply with any provision of the AWQMP
- Accept treatment for industrial wastes, subject to the provisions of a pretreatment program approved by Ohio EPA or Michigan EGLE
- Effectively manage waste treatment works and related point and nonpoint source facilities and practices in conformance with the Plan
- Directly or by contract, design and construct new treatment works, and operate and maintain new and existing collection and treatment facilities
- Assure, in the implementation of its portion of the AWQMP, that each participating community pays its proportionate share of related costs
- Prepare Facility Plans or sewage studies to meet Ohio EPA or Michigan EGLE requirements and the 208 Plan’s water quality goals.
- Serve as lead applicant to arrange financing for the construction of needed sewerage improvements.
- Join into service agreements with other political jurisdictions within the FPA to operate and maintain sewers, administer billings, and other activities for system operation.

The TMACOG AWQMP recognizes four types of DMAs, which each have specific responsibilities. The DMAs in the TMACOG region are listed in Table 3-2.

- Counties, Municipalities, and Regional Water and Sewer Districts that collect and/or treat municipal wastewater –
  - responsibilities include protecting water quality and public health by meeting the requirements of their National Pollutant Discharge Elimination System (NPDES) permits
- County and municipal health departments –
  - responsibilities include protecting water quality and public health by regulating the installation and maintenance of sewage treatment systems for one, two, and three household residences.
- Counties, municipalities, and townships that are responsible for stormwater NPDES permits –
  - responsibilities include protecting water quality by managing stormwater runoff in compliance with applicable NPDES Stormwater permit(s).
- County Soil and Water Conservation Districts –
  - responsibilities include providing education and technical assistance to farmers to prevent water pollution from agricultural sediment, nutrients, and pesticides and to encourage fish and wildlife habitat consistent with productive agriculture.

Table 3 - 2: TMACOG Region Designated Management Agencies

County	DMA	Agriculture	Stormwater	Sanitary Sewage or On-Site
Lucas	Lucas County		•	•
Lucas	Village of Berkey			•
Lucas	Village of Holland		•	•
Lucas	Village of Harbor View		•	•
Lucas	Township of Jerusalem		•	
Lucas	City of Maumee		•	•
Lucas	Township of Monclova		•	
Lucas, Ottawa	City of Oregon		•	•
Lucas	Village of Ottawa Hills		•	•
Lucas	Township of Spencer		•	
Lucas	Township of Springfield		•	
Lucas	Township of Swanton		•	
Lucas, Fulton	Village of Swanton		•	•
Lucas,	City of Sylvania		•	•

County	DMA	Agriculture	Stormwater	Sanitary Sewage or On-Site
Monroe				
Lucas	Township of Sylvania		•	
Lucas, Monroe, Wood	City of Toledo		•	•
Lucas	Township of Washington		•	
Lucas	Township of Waterville		•	
Lucas	City of Waterville		•	•
Lucas	Village of Whitehouse		•	•
Lucas	Toledo/Lucas County Health Department			•
Lucas	Lucas Soil and Water Conservation District	•		
Monroe	Monroe County		•	•
Monroe	Township of Bedford		•	•
Monroe	Township of Erie		•	
Monroe	City of Luna Pier			•
Monroe	Monroe County Health Department			•
Monroe	Monroe Soil Conservation District	•		
Monroe	Township of Whiteford		•	
Ottawa	Ottawa County		•	•
Ottawa	Township of Allen		•	
Ottawa	Township of Clay		•	
Ottawa	Village of Clay Center			•
Ottawa, Sandusky	Village of Elmore			•
Ottawa, Sandusky	Village of Genoa			•
Ottawa	Village of Marblehead			•
Ottawa	Village of Oak Harbor			•
Ottawa	City of Port Clinton			•
Ottawa	Village of Put-in-Bay			•
Ottawa	Carroll Township Regional Water and Sewer District			•

County	DMA	Agriculture	Stormwater	Sanitary Sewage or On-Site
Ottawa	Ottawa County Health Department			•
Ottawa	Ottawa Soil and Water Conservation District	•		
Sandusky	Sandusky County			•
Sandusky, Erie, Huron, Seneca	City of Bellevue			•
Sandusky	Village of Burgoon			•
Sandusky	City of Clyde			•
Sandusky	City of Fremont		•	•
Sandusky	Sandusky Township Sewer District			•
Sandusky	Village of Gibsonburg			•
Sandusky, Seneca	Village of Green Springs			•
Sandusky	Village of Helena			•
Sandusky	Village of Lindsey			•
Sandusky	Village of Woodville			•
Sandusky	Sandusky County Health Department			•
Sandusky	Sandusky Soil and Water Conservation District	•		
Wood	Wood County		•	•
Wood, Sandusky	Northwestern Water and Sewer District			•
Wood	City of Bowling Green		•	•
Wood	Village of Bradner			•
Wood, Seneca, Hancock	City of Fostoria		•	•
Wood	Village of Grand Rapids			•
Wood	Village of Haskins			•
Wood	Township of Lake		•	
Wood	Village of Luckey			•
Wood	Township of Middleton		•	

County	DMA	Agriculture	Stormwater	Sanitary Sewage or On-Site
Wood	Village of North Baltimore			•
Wood	City of Northwood		•	•
Wood	Village of Pemberville			•
Wood	City of Perrysburg		•	•
Wood	Township of Perrysburg		•	
Wood	Village of Portage			•
Wood	Township of Troy		•	
Wood	Village of Walbridge		•	•
Wood	Village of Wayne			•
Wood	Wood County Health Department			•
Wood	Wood Soil and Water Conservation District	•		

3.1.2 - Areawide Agency Responsibilities

TMACOG is the designated Areawide Water Quality Management Planning Agency for Lucas, Wood, Ottawa, and Sandusky, in Ohio; and Erie, Bedford, and Whiteford Townships and the City of Luna Pier in Monroe County, Michigan. TMACOG's role as the designated Areawide agency is to maintain and coordinate the implementation of the Plan through the TMACOG Water Quality Council and its subcommittees.

TMACOG's role includes:

i. Continue planning and updating the AWQMP
ii. Provide a forum for Areawide policy decision-making on water quality concerns
iii. Coordinate activities among DMAs to solve point and nonpoint source water quality problems
iv. Serve as a regional advocate on water quality issues at the State and Federal levels
v. Resolve conflicts among DMAs and with the AWQMP
vi. Identification and prioritization of areas (including watersheds) for habitat protection and restoration, and where agricultural nonpoint pollutant load reductions are needed.
vii. Identification and prioritization of critical urbanizing watersheds where water quality impairments are caused by expanding urbanized areas
viii. Submit the AWQMP to the States of Ohio and Michigan for certification
ix. Coordinate AWQMP with other State, Federal, and Regional plans, including:
    a. The State Implementation Plan (SIP) for Air Quality
    b. Coastal Zone Management Plan

c. Watershed plans covering all or part of the major drainage basins: the Maumee, Portage, Sandusky
d. Sewerage funding programs through Housing and Urban Development (HUD), USDA, and the state revolving loan programs
e. TMACOG Transportation Plan
f. Nonpoint Source Implementation Strategies (NPS-IS or “9-Element Plans”)
g. Total Maximum Daily Load (TMDL) Reports

TMACOG staff will support implementation and funding of public wastewater collection and treatment needs identified in Chapters 5 and 6 of the TMACOG 208 Plan as follows:

i. Assist DMAs in planning, implementing, and financing sanitary sewage infrastructure.
ii. Coordinate DMAs to provide technical assistance to plan efficient and cost-effective sanitary sewage facilities.
iii. Coordinate DMAs and provide technical assistance to assist in meeting NPDES permit requirements.
iv. Review application to Ohio EPA for Permits to Install in coordination with DMAs to determine consistency with the TMACOG AWQMP
v. Coordinate DMAs to identify Critical Sewer Areas
vi. Coordinate DMAs to update the individual Facility Planning Area descriptions
vii. Maintain the AWQMP

3.1.2.1 The Role of the TMACOG Water Quality Council

The Water Quality Council is the principal forum for reviewing and making the Areawide Water Quality Management Plan. The Water Quality Council uses a representative structure for broad participation, both in terms of geography and expertise. The Water Quality Council Operating Procedures are included as part of this plan by reference. Plan Amendments recommended by the Water Quality Council go to the Board of Trustees for final action.

Although not every DMA has a seat on the Water Quality Council, DMAs may bring issues before the Water Quality Council and request Plan Amendments. Membership in TMACOG is open to all DMAs but is not a prerequisite for participation on the Water Quality Council.

TMACOG’s authority to assume responsibility for the Areawide monitoring, planning, coordination, and conflict resolution are established through the following codes:

i. §208 of the Federal Water Pollution Control Act Amendments (P.L. 92-500) as amended by the Clean Water Acts of 1977, 1982, and 1987 (P.L. 95-271, 97-440, and 100-4)
ii. Federal Register §35.1521 et seq. Vol. 44 No. 101, Wednesday May 23, 1979, Rules and regulations
iii. Ohio Revised Code Section 167.01 - 167.08, "Regional Councils of Governments."
iv. Ohio Revised Code Section 6111.03, "Powers of Director of Environmental Protection."
v. Urban Cooperation Act of 1967, Michigan Public Act No. 7, §124.501 - 124.512 (Ex. Sess.)
vi. Syllabus: Ohio Attorney General’s Opinion 79-018 (May 24, 1979)

vii. Bylaws of the Toledo Metropolitan Area Council of Governments
viii. Implementing Documents and Resolutions

3.1.3 Role of Federal and State Agencies

Several federal and state agencies have regulatory oversight in water quality management. Local DMAs recognized by this plan are responsible for fulfilling legal requirements set by the federal and state agencies. The federal agencies are U.S. Environmental Protection Agency (U.S. EPA) and U.S. Department of Agriculture (USDA). The state agencies are Ohio EPA (Ohio EPA), Ohio Department of Natural Resources (ODNR), Ohio Department of Agriculture (ODA), Michigan Department of Environment, Great Lakes, and Energy (Michigan EGLE), and Michigan DNR (Michigan DNR).

Section 4 - AWQMP Decision-making Policies

4.1 FPA Boundary-based decisions

4.1.1 - Determining Boundaries

i. The guiding principles used in delineating FPAs under this plan are:
    a. FPAs must be in compliance with the CWA requirements, notably
        i. "Waste treatment management shall be on an Areawide basis." [Clean Water Act §201(C)]
        ii. "Identification of those areas which, as a result of urban-industrial concentrations or other factors have substantial water quality control problems." [Clean Water Act §208(A)(2)]
    b. FPAs should use sound planning practices to identify future needs for wastewater collection and treatment facilities. An FPA boundary is a planning area for a single specific present or future wastewater plant as well as a service area for the designated wastewater treatment plant. An FPA may include service areas for multiple treatment plants when those plants are interconnected to treat varying flow rates.
    c. FPAs should be compact and contiguous concentrations of urban land uses without islands of one FPA surrounding another.
    d. Remote service areas may be included in an FPA when connected by force main and separated by areas that should remain un-urbanized.
    e. FPAs should be designed to serve residents in the most cost-effective manner without duplication of service.
    f. FPA boundaries should be consistent with adopted local land use plans.
    g. FPA boundaries should be developed through cooperative dialogue among affected local jurisdictions. TMACOG encourages neighboring governments to resolve sewage service conflicts through a collaborative process. If affected local jurisdictions are unable to resolve conflicts regarding an amendment to TMACOG's plan through a collaborative process, then these issues will be resolved by TMACOG's Board of Trustees' vote on the Plan Amendment which is TMACOG's final decision in the matter. (See Section 6 Dispute Resolution)

4.1.2 Determining Service

i. Sewer Service shall be determined based on the following
   a. Where a road is an FPA boundary, properties immediately adjacent to either side of that road may be served, as noted below under "Land Use Planning."
   b. If a DMA proposes serving an area outside its currently established Facility Planning Area, it may request a Plan Amendment as described in Section 5.1.2.
   c. Once an area has sanitary sewage service as part of an FPA, it shall continue to be served by that wastewater facility, except:
      i. When the wastewater facility is no longer able to meet its NPDES permit requirements due to extraneous water, unanticipated growth, or treatment quality problems.
      ii. By mutual agreement of the affected DMAs.
   d. A residence or business within an FPA that generates sewage or produces an effluent from treated sewage, sewage sludge, or septage shall connect to that FPA's sewage system if the sewer is available and accessible
ii. If a municipality sells or gives its sanitary sewage system to another public agency (such as an Ohio Revised Code (ORC) §6119 District) or political subdivision of the state, the AWQMP will delist the original DMA, and transfer the DMA designation to the new owner of the infrastructure.

4.1.3 Extension of sewer lines

i. Public sanitary sewers should not be extended to areas outside FPAs. Areas outside FPAs should be reserved open space, farmland, or low density residential. "Low density residential" is here considered development that is sparse enough to provide on-site sewage treatment according to the policies laid out in Section 4.2 of this Chapter.
ii. The 208 Plan's policy is a sewer extension be approved under the following conditions:
   a. When a developed area is outside an FPA but contiguous to it, and
   b. Sewers in the FPA are close enough to be considered "available" under the applicable Ohio State law or local ordinance in Michigan.
iii. When sewers are extended outside an FPA, the FPA boundary should be amended to include the served area.
iv. Ohio EPA and Michigan EGLE may approve sanitary sewer extensions proposed within FPAs if they are consistent with this Plan.

4.1.4 Septage Pretreatment Facilities

i. The policy question is whether a privately-owned septage pre-treatment facility duplicates a public investment in a POTW. In most cases, it does not. In areas outside FPAs, and in FPAs that do not include restrictions, privately-owned septage pretreatment facilities may be permitted. In cases where POTWs provide septage receiving facilities and have adequate capacity, restrictions on private septage pre-treatment facilities may be stipulated in the FPA description. If no restriction is mentioned in the FPA description, they may be permitted.

4.2 Onsite sewage treatment

4.2.1 Agency Roles

4.2.1.1 TMACOG

The TMACOG Water Quality Council shall maintain the On-site Sewage Treatment Chapter with a list of Best Management Practices (BMPs) and recommended policies. Each management agency shall be responsible for its own list of practices to be included in 208 Plan updates. The TMACOG Water Quality Council shall:

i. Work to implement the creation of on-site waste management districts responsible for planning, design, installation, operation, and maintenance, and monitoring of on-site systems within sub-county or given problem areas.
ii. Support the periodic updating of soil surveys.
iii. Seek new improved legislation from the Ohio Legislature as detailed in the Recommended Implementation Activities section at the end of this chapter.
iv. Support long-term research on effective and practical STSs for the soil conditions of our region.

4.2.1.2 County Boards of Health

Ohio Boards of Health shall administer local on-site sewage treatment regulations pursuant to the OAC 3701-29. The Monroe County Health Department shall administer the Monroe County Sanitary Code.

i. The Boards local boards of health should coordinate its regulations and policies with the other agencies, including land use planning, capital improvements programming, and public wastewater treatment to prevent the installation of home sewage systems in unsuitable areas.
ii. The Water Quality Council and the management agencies [Boards of Health] shall work together to improve the programs for home sewage treatment in accordance with the recommendations of Chapter 6.

4.2.2 TMACOG Onsite Sewage Treatment Policies

i. On-site sewage treatments systems serving individual residences and businesses shall not be permitted within an FPA where a public sewer is available and accessible. Where sewers are not available and accessible within an FPA, on-site systems shall be permitted, subject to policies set in this section.

4.2.2.1 Available and Accessible Sewers

i. The Ohio Administrative Code (OAC) Section 3701-29-06(I) states, “Whenever a sanitary sewage treatment system becomes accessible to a dwelling or structure served by a STS, the dwelling and/or structures shall be connected to the sanitary sewage system and the STS abandoned in accordance with rule 3701-29-21 of the Administrative Code.”
ii. The designation of an accessible sewer is determined by consultation with the Designated Management Agency (DMA) responsible for sewage collection. It depends on the distance between the sanitary sewer and the house or business that would be served, and whether there are any physical barriers that render connecting it to the sewer impracticable. See Table 3-3 for local criteria.

iii. The availability of a sanitary sewer system is determined by the DMA and Ohio EPA/Michigan Department of Environment, Great Lakes, and Energy (EGLE). It depends on:
   a. Whether the receiving sanitary sewer system has the capacity to transport and treat the additional sewage, and
   b. Whether the sanitary sewer is a gravity sewer, an interceptor sewer, or a force main, and
   c. Whether interceptors or force mains are available for tapping is a policy the DMA sets.

i. It is required in Ohio that boards of health review proposed subdivisions for any restrictions on the use of onsite sewage systems, and consult with appropriate DMAs to determine accessibility of sanitary sewers, and the TMACOG 208 Plan.

ii. Sewers under the County Commissioners are accessible if within 200 feet of the foundation wall of the structure (Ohio Revised Code [ORC] 6117.51). Ohio Boards of Health may establish more stringent "accessibility" distance rules.

iii. While Ohio law on availability is the same for gravity sewers and force mains, there are practical aspects that distinguish them. Whether interceptors or force mains are available for tapping is a policy the DMA sets. This 208 Plan recommends criteria for connection to pressure sewer or force main in Chapter 6.

Table 3 - 3: Locally Established Criteria for "Accessible" Public Sewers

County	Criteria
Lucas County, Ohio	Uses policy of jurisdiction responsible for sewers.
Monroe County, Michigan	State Law authorizes local governments to require connection to a public sewer.
Ottawa County, Ohio	Existing residences must tie into an available gravity or pressure sewers.
Sandusky County, Ohio	Must tap into an available public sanitary sewer that the Board of Health has determined to be accessible. The Board of Health will make a determination on a lot-by-lot basis, depending on DMA's accessibility assessment, 208 Facility Planning Area, whether the site is in a Critical Sewage Area, density of housing units, and environmentally sensitive areas.
Wood County, Ohio	In its 2015 Supplemental Rule Package, the Wood County Board of Health re-established a more stringent standard of 400 feet for the DMA to determine whether a sanitary sewer is available and accessible.

4.2.2.2 Package Plants

i. Under this Plan, a package plant is inherently a temporary sewage treatment facility, to be used only until such a time as public sewage service becomes available. As a temporary facility, a package plant does not require an FPA. In some cases, a small prefabricated extended aeration wastewater treatment plant is owned and operated by a DMA as a permanent facility. In such a case, the plant is considered a POTW, requiring an FPA, for which it is the principal wastewater treatment facility.

ii. In Ohio, Ohio EPA makes a determination whether or not to require connection to a sanitary sewer when the PTI is approved. The following 208 policies shall determine the issuance of NPDES permits for package plants.
   a. Package plants within FPAs shall not be permitted where a public sewer is “available” under applicable state or local regulations.
   b. Availability of public sewers is determined by the DMAs responsible for providing sanitary sewage service at the location in question.
   c. New or existing package plants shall be permitted inside FPAs only where public sewers are not available.
   d. NPDES permits shall be required for all package plants regardless of their size.
   e. All PTIs and NPDES permits for new or existing package plants shall be required to tap when public sewers become available.
   f. No PTI or NPDES permit shall be granted or renewed for either a new or existing package plant where a public sanitary sewer is available.
   g. No PTI or NPDES permit shall be issued for a new, expanded, or upgraded package plant where making a public sewer available would cost the same or less than the cost of the new, expanded, or upgraded package plant.
   h. Package plants may be permitted in areas of FPAs where public sewage service is not available.

iii. Package plants shall be required to tap into public sewers when sewers become available and accessible, regardless of the age, condition, or design capacity of the package plant. New package plants shall be permitted only on this condition.

iv. Most unincorporated areas are covered by ORC §6117 which defines “available” as 200 feet from the foundation of the building to the edge of the sewer right of way. Wood County regulations use 400 feet, subject to confirmation of availability by the DMA. In areas covered by Regional Water and Sewer Districts, “…require such connection so as to prevent or abate pollution or protect the health and property of persons…”. In Michigan, State Law authorizes local governments to require connection to a public sewer.

v. Package plants should be available as a sewage treatment option for subdivisions where public sewers are not available, except where disallowed by the policy of the FPA (see Chapter 5). In such cases, a properly operated and maintained package plant may be better environmentally than individual septic systems. Such a package plant should include two provisos:
   a. The package plant is owned and operated by the County Sanitary Engineer (Ohio), Drain Commissioner (Michigan), a municipality with qualified staff, or Regional Water and Sewer District. (Ohio).
   b. The plant has an NPDES permit and meets its effluent requirements.

vi. Centralized sewage systems shall be given first consideration for sewage treatment in residential subdivisions.

vii. Connection to an existing treatment plant is preferred, with construction of a package treatment plant the secondary alternative.

viii. If a sewage collection system is not available and accessible, and a package treatment plant is not feasible in the judgment of Ohio EPA, the local Board of Health may allow an on-site treatment system, except as prohibited by individual FPAs. As indicated below, there are variations among the county subdivision regulations pertaining to sewage treatment requirements. According to each county's subdivision regulations, package treatment plants must be constructed by the developer of a subdivision, and then deeded to the respective county.

ix. STS (including HSTS and SFOSTS) and package plants shall be abandoned and tapped when public sewers become available and accessible.

x. Some Facilities Planning Areas require new residential subdivisions to be served by that FPA's public wastewater treatment plant, not package plants, or on-site systems. See the following FPAs for more information:
   a. Bellevue
   b. Clyde
   c. Fremont

4.2.2.3 Home Sewage Treatment Systems

i. Under a Regional Water and Sewer District the rule is to "Require the owner of any premises located within the district to connect his premises to a water resource project determined to be accessible to such premises and found to require such connection so as to prevent or abate pollution or protect the health and property of persons in the district. Such connection shall be made in accordance with procedures established by the board of trustees of such district and pursuant to such orders as the board may find necessary to ensure and enforce compliance with such procedures" (ORC 6119.06).

ii. In Michigan, state law authorizes local governments to require connection to a public sewer.

iii. It is the policy of this Areawide Water Quality Management Plan (AWQMP) that
   a. No private sewage treatment system shall be installed, maintained, or operated on any property accessible to a public sanitary sewage system.
   b. For the purposes of this Plan, "accessible to a public sanitary sewage system" means
      i. The DMA responsible for public sanitary sewers in the FPA will grant permission to connect to their system, and
         1. A connecting point to the public sewer from the foundation wall of any structure with plumbing drains along the shortest direct line distance is within a specified distance. That specified distance is 200 feet unless a different figure is given in Table 3-3 of individual criteria for each county, or
         2. Ohio EPA or Michigan EGLE has determined that a public sanitary sewer is available, considering the distance to the sewer, physical barriers, ability of the sewage system to transport and treat the wastewater, cost effectiveness, overflows from the sewer system, or other environmental or public health issues, or

3. The FPA has a policy that new subdivisions shall be required to connect to the public sanitary sewage system, and may not be served by septic systems or package plants. This policy applies only to individual FPAs where the DMAs have requested it. Please see the individual FPA Descriptions in Chapter 5 of this Plan.

c. On-site systems should not be permitted on new lots or new subdivisions where soil-based treatments are not feasible. Effluent discharges to surface waters may be permitted only for replacement systems where soil-based treatment is not feasible, and in compliance with NPDES requirements. New home sites require replacement sewage treatment system areas to be identified for on-site disposal.

4.2.2.4 Subdivisions and New Lots

In areas where a sanitary sewage system is accessible, the policy of this Plan is that new on-site systems shall not be permitted. For proposed subdivisions of more than 25 lots, on-site sewage systems may be approved only with written documentation from Ohio EPA that a sanitary sewer is not accessible. A board of health may establish a policy to require this rule to smaller subdivisions. OAC 3701-29-08(B) states:

> *Any person proposing a subdivision or new lot(s) for review by the board of health shall submit an application and sufficient information to determine compliance with the requirements of [OAC 3701-29.*
>
> *When a proposed subdivision includes the creation of at least twenty-five lots, or for any fewer numbers of lots as required by the board of health, the request shall include written consultation from Ohio EPA concerning the subdivision's accessibility to existing sanitary sewerage systems as described in paragraph (I) of rule 3701-29-06 of the Administrative Code, and risks to surface and ground water resources.*

ii. Household sewage systems with off-lot discharges (i.e., requiring NPDES permits) are prohibited on new lots or lots in subdivisions

Section 5 – Planning Policies

5.1 AWQMP Planning Process

5.1.1 Plan Development and Update

i. This Plan is subject to regular updates as conditions change. Any changes are reviewed and enacted through the TMACOG Water Quality Council, which has been charged with responsibility for maintaining the §208 Plan. The Water Quality Council, through its operating procedures, provides representation throughout the region, including a seat reserved for each County and the City of Toledo. DMAs recognized by this Plan may request a Plan Amendment as described in Section 5.1.2.

ii. Maintaining the AWQMP is necessary to keep it relevant for local and regional needs, including:

   a. Wastewater treatment facility needs (**Chapter 5**) change as communities replace or upgrade their systems and provide service to new areas.

   b. Critical Sewage Areas (**Chapter 6**) change, as designated by local Health Districts, when stream or septic system testing indicates new areas, or when a sewer extension eliminates the problems.

iii. TMACOG staff will work with DMAs and Water Quality Council to conduct regular updates of the TMACOG AWQMP. These updates will be conducted as follows:

   a. Annual FPA updates
      i. Capital improvement schedules
      ii. New or planned sewer infrastructure
      iii. Changes to capacity
      iv. Service areas
      v. Critical sewage areas
      vi. DMA contact information
   b. Chapter updates as determined necessary by staff and Water Quality Council
   c. Biennial update of Ohio and Michigan Integrated report Data
   d. Biennial Service area map data.

5.1.2 Plan Amendments

iii. The TMACOG Water Quality Council is the forum for review of AWQMP amendments. Amendment requests may be made by members of the Water Quality Council or Designated Management Agencies (DMAs). The Water Quality Council makes recommendations on Plan amendments to the TMACOG Board of Trustees, which adopts the Plan. When all or part of the Plan is amended by the TMACOG Board of Trustees, the new version supersedes all previous versions of that part of the Plan. After adoption by the Board of Trustees, the Plan is submitted to the Governors of Ohio and Michigan for Certification.

iv. The Areawide Water Quality Management Plan is maintained by the Water Quality Council and may be amended between regular updates to meet changing conditions. The amendment process is as follows:
   a. A DMA may raise an issue in which it has a material interest regarding the AWQMP, which, in their opinion, requires a Plan amendment, to the attention of the Chair of the Water Quality Council, or the TMACOG Director of Water Quality Planning.
   b. TMACOG will convene meeting(s) of the affected parties to discuss the issues and attempt to reach a solution by mutual agreement.
   c. Following meeting(s) of the affected parties, the proposed Plan amendment will be placed on the Water Quality Council agenda at the request of any DMA that is affected. All parties to the issue will be given an opportunity to present their issues to the Water Quality Council.

d. The Water Quality Council shall make recommendations on the proposed Plan amendments according to its Operating Procedures. Its recommendation, regardless of outcome will be forwarded to the Board of Trustees.
e. The TMACOG Board of Trustees shall review the recommendations of the Water Quality Council and vote whether or not to adopt the requested Plan amendment.
f. If the TMACOG Board of Trustees action results in changes to the Areawide Water Quality Management Plan, TMACOG will submit the revised Plan to the Governors of Ohio and Michigan for Certification.

5.2 Critical Areas

The TMACOG AWQMP identifies critical areas that contribute to water quality problems. Section 5.2 describes the criteria used to delineate these areas and how the identification of these areas is used to set regional priorities

5.2.1 Critical Sewage Areas (CSAs)

i. County/Local boards of health identify CSAs. CSAs are areas with concentrations of failed or failing onsite sewage systems, based on sampling results, complaints received by the health department; or areas with suspected failures based on health department observations and best professional judgment. System failures result in known or suspected cases of:
   a. Surface water contamination, and/or
   b. Ground water contamination, and/or
   c. Public health nuisances
ii. County/local health departments identify CSAs as places where existing system upgrades/replacements often will not solve the problem or are not an optimal solution because:
   a. There is a significant concentration of onsite systems that are known or suspected to have failed.
   b. Most of the systems are on small lots that do not have room for replacement leaching fields.
   c. Soil conditions for leaching fields are poor due to shallow bedrock, tight silt/clay soils, and/or seasonally high groundwater.
iii. Critical Sewage Areas shall be considered TMACOG's priority areas for:
   a. Ohio EPA, Michigan EGLE, and health departments to conduct sanitary surveys.
   b. inspection and increased maintenance of onsite systems until a central public sanitary sewerage system is in place.
   c. public sanitary sewers or innovative community STSs to replace concentrations of individual systems. For CSAs where a public sanitary sewerage system is the best alternative, the priority order for construction may be affected by the availability of financial assistance.
   d. financial assistance to homeowners for installing public sanitary sewers.
iv. TMACOG's Critical Sewage Areas are listed and mapped in Chapter 6

5.1.2 Critical Urbanizing Watersheds

i. To address the water quality impairments caused by expanding urbanized areas, this Plan recommends priority areas, identified as Critical Urbanizing Watersheds. This designation is intended to prioritize watersheds that are undergoing urbanization and meant only to be used by this Plan. Watershed designations are based on three criteria:
   a. Ohio Environmental Protection Agency (Ohio EPA) or Michigan Department Environment, Great Lakes, and Energy (Michigan EGLE) classify streams as non-point source “impaired.” Urban runoff and other urban sources such as construction sites are identified as being known or suspected sources for the nonpoint source impact/impairment.
   b. The watershed is undergoing rapid urban development and/or is under pressure for development.
   c. Sensitive or unique habitat or natural resources in the watershed are threatened because of urban development, such as the Oak Openings Region (Refer to TMACOG Areawide Water Quality Management Plan, Chapter 3 “Environmental Policies” — Section on “Policy and Goal Statements” for more information).

ii. TMACOG’s Critical Urbanizing Watersheds are mapped in Chapter 8.

5.1.3 Priority Agricultural Watersheds

i. This plan identifies priority watersheds (hydrologic unit code [HUC] 12 digit) based on the number of causes for water quality impairments that may be related to agricultural practices. This means the cause of an impairment is the result of a source linked to agricultural practices.

ii. TMACOG’s Priority Agricultural Watersheds are mapped in Chapter 7.

5.3 Land Use Planning and Sewage Facility Planning

i. The CWA calls for an areawide approach to water quality management, originally used to foster areawide cooperation in wastewater treatment: “...shall identify each area within the State which, as a result of urban-industrial concentrations or other factors, has substantial water quality control problems...” This very broad language takes on a new meaning with the elimination of most point source pollution problems, and the recognition that water quality control is now dependent on nonpoint source pollution and aquatic habitat.

ii. Land use planning is inseparable from planning sanitary sewers service areas. The availability of public sewers is necessary for urban development, especially in a region where soil conditions are very often unsuitable for on-site sewage disposal. With urban development comes pollution from urban runoff, drainage of wetlands, and loss of farmland. A link between established land use plans and sewer planning allows local governments to anticipate infrastructure needed for growth, rather than reacting to water pollution problems.

iii. Land use plans, zoning, and the AWQMP are closely related and are coordinated through the TMACOG Transportation and Water Quality Councils. The FPAs are based on county and local land use, comprehensive, or master plans. Areas designated for urban development by these plans have been included within FPA boundaries. Where a sewer is built along a boundary road, it makes sense to serve both sides of the road. Land use and development policies should be applied to FPAs with this level of detail in mind.

iv. Zoning is the local government's tool for implementing its land use plan. Since zoning controls what is built, and where, it is important for zoning and this Plan to support each other. FPAs and the information they contain are an integral part of land use planning. In deciding an area's future land use, it is essential to ask whether sewage facilities will be adequate to provide service:
   a. Is the collection system adequate to handle the planned growth?
   b. Does the wastewater treatment facility responsible for providing service to the area have capacity for the planned growth?
   c. How much growth is projected for that wastewater treatment facility in the land use plans and zoning of other jurisdictions in its service area?
   d. Does the FPA's sewage system have problems with sewer overflows, or extraneous stormwater entering the sewers? Will it be necessary to remove stormwater flows from the system in order to handle sanitary sewage due to planned growth?
   e. What will the ultimate development density be? If an area is developed as low-density and sewers are sized accordingly, the sewers may become overloaded if the density is increased in the future.

Section 6 – Dispute Resolution

6.1 Dispute resolution process

i. Where a conflict arises among the jurisdictions of an FPA, any political jurisdiction may request a plan amendment. TMACOG encourages neighboring governments to resolve sewage service conflicts through a collaborative process. If the affected jurisdictions are unable to resolve conflicts regarding an amendment to TMACOG's plan through a collaborative process, then these issues will be resolved by TMACOG's Board of Trustees' vote on the plan amendment, which is TMACOG's final decision on the matter.

Chapter 4: Federal and State Laws and TMACOG Position Statements

I. Introduction

Areawide Water Quality Management Policies

One role of this Plan is to describe the roles and responsibilities of the region's many local governments in carrying out specific aspects of the Clean Water Act. These roles protect the environment and public health through municipal sewage services. They also include promoting good water quality and habitat by preventing non-point source pollution. These governmental services are laid out as *Areawide Water Quality Management Plan* (AWQMP) policies in the five chapters following this one:

Chapter 4 - Water Quality Management Framework

Chapter 5 - Public Wastewater Treatment

Chapter 6 - On-Site Sewage Treatment

Chapter 7 - Agriculture, Drainage, and Habitat

Chapter 8 - Stormwater Management

Treating or preventing water pollution does not completely fulfill the "fishable and swimmable" goals of the Clean Water Act. A healthy and productive Lake Erie fishery, for instance, requires more than just pure water. It requires a food chain to support the fish, all of which requires habitat and food sources throughout the lake, rivers, and all their tributaries. In addition, there are sources of water quality impairment that don't fit neatly into point or non-point categories. One purpose of this chapter is to record TMACOG's policies on such issues.

In addition to local governments, Designated Management Agencies (DMAs) (see **Chapter 4**), and regulatory agencies, there are many stakeholders in natural resources. Business and industry require clean water for manufacturing, commerce, transportation, and tourism, to name just a few uses.

Non-profit agencies, governmental agencies, and special districts also play important roles in the region's water quality. Examples include park districts, land conservancies and trusts, and watershed councils. Some stakeholders work through Toledo Metropolitan Area Council of Governments (TMACOG) committees; others are part of another organization, sometimes with the participation of TMACOG members or staff. This chapter recognizes stakeholder plans in two ways:

- Documents developed by TMACOG committees or staff are incorporated by reference as part of this AWQMP.
- Documents of other stakeholders are recognized as compatible plans, whose goals TMACOG supports.

Both types of documents so recognized are listed in Appendix B.

II. Water Quality Goals

Water quality is regulated through Water Quality Standards in the Ohio Administrative Code (OAC), and in the Clean Water Act through National Pollutant Discharge Elimination System (NPDES) Permits. NPDES permits legally require wastewater to be cleaned to specific parameters before it may be discharged. State and federal laws regulate wetlands, landfills, onsite sewage systems, animal feeding operations, among others. Other laws and documents define the principles of water quality protection.

Clean Water Act

The Clean Water Act (PL 92-500 and its revisions) is often characterized as calling for "fishable and swimmable" waters. The objective of the Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. The provisions of the Act include (33 U.S. Code §1251 Title I, Sec. 101 (a)):

(1) it is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985;

(2) it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983;

(3) it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited;

(4) it is the national policy that Federal financial assistance be provided to construct publicly owned waste treatment works;

(5) it is the national policy that areawide treatment management planning processes be developed and implemented to assure adequate control of sources of pollutants in each State;

(6) it is the national policy that a major research and demonstration effort be made to develop technology necessary to eliminate the discharge of pollutants into the navigable waters, waters of the contiguous zone and the oceans; and

(7) it is the national policy that programs for the control of nonpoint sources of pollution be developed and implemented in an expeditious manner so as to enable the goals of this Act to be met through the control of both point and nonpoint sources of pollution.

The Water Pollution Control Federation, now the Water Environment Federation, made the following observations (Water Pollution Control Federation, 1982):

> *PL 92-500 established the following precepts: <u>First</u>, no discharger can assume the right to pollute navigable waters. All discharges must obtain a permit to continue such actions. … <u>Second</u>, permits shall contain limitations on the composition and concentrations of the polluting substances in them. … <u>Third</u>, some of the permit conditions are based on the technological capability of control, rather than on the biological capability of receiving waters to purify themselves. "Dilution is not the solution to pollution," as the saying goes. … <u>Fourth</u> and finally, controls higher than the minimum are to be based on receiving water quality.*

The Six "Free-Froms"

OAC, besides setting quantifiable water quality standards and stream use attainments, states clean water goals in qualitative terms that are easy to visualize. It includes six statements of types of pollution that streams are to be free from (OAC 3745-1-04 Water Quality Standards). They define a desired future state for waterways, which discharge permits and numerical standards are intended to achieve.

> *The following general water quality criteria shall apply to all surface waters of the state including mixing zones. To every extent practical and possible as determined by the director, these waters shall be:*
>
> *(1) Free from suspended solids or other substances that enter the waters as a result of human activity and that will settle to form putrescent or otherwise objectionable sludge deposits, or that will adversely affect aquatic life;*
>
> *(2) Free from floating debris, oil, scum and other floating materials entering the waters as a result of human activity in amounts sufficient to be unsightly or cause degradation;*
>
> *(3) Free from materials entering the waters as a result of human activity producing color, odor or other conditions in such a degree as to create a nuisance;*
>
> *(4) Free from substances entering the waters as a result of human activity in concentrations that are toxic or harmful to human, animal or aquatic life and/or are rapidly lethal in the mixing zone;*
>
> *(5) Free from nutrients entering the waters as a result of human activity in concentrations that create nuisance growths of aquatic weeds and algae.*
>
> *(6) Free from public health nuisances associated with raw or poorly treated sewage. A public health nuisance shall be deemed to exist when the conditions set forth in paragraph* [below] *are demonstrated.* [the Ohio Administrative Code goes on to define "nuisance."]

The Six "Free-Froms" are also stated as general objectives of the Great Lakes Water Quality Agreement (IJC, 1989).

The Great Lakes Water Quality Agreement

The U.S. and Canada signed the Great Lakes Water Quality Agreement (GLWQA) in Ottawa on November 22, 1978. The GLWQA's stated purpose was (IJC, 1989):

> *The purpose of the Parties is to restore and maintain the chemical, physical, and biological integrity of the waters of the Great Lakes Basin Ecosystem. In order to achieve this purpose, the Parties agree to make a maximum effort to develop programs, practices and technology necessary for a better understanding of the Great Lakes Basin Ecosystem and to eliminate or reduce to the maximum extent practicable the discharge of pollutants into the Great Lakes System.*
>
> *Consistent with the provisions of this Agreement, it is the policy of the Parties that:*
>
> *(a) The discharge of toxic substances in toxic amounts be prohibited and the discharge of any or all persistent toxic substances be virtually eliminated;*
>
> *(b) Financial assistance to construct publicly owned waste treatment works be provided*

by a combination of local, state, provincial, and federal participation; and

(c) Coordinated planning processes and best management practices be developed and implemented by the respective jurisdictions to ensure adequate control of all sources of pollutants.

The International Joint Commission (IJC) is a binational organization established by the Boundary Waters Treaty in 1909 to advise the Governments of the U.S. and Canada on preventing or resolving problems along their common border. This includes addressing the pollution problems of the Great Lakes. Over the years the IJC has become involved in issues related to such matters as water and air quality, lake levels, and power generation.

Several Annexes to the Agreement have been adopted over the years. Two are of specific concern for this Areawide Water Quality Management Plan.

Annex 3, the Phosphorus Load Reduction Supplement was signed on October 16, 1983 (IJC, 1989).

The purpose of the following program is to minimize eutrophication problems and prevent degradation with regard to phosphorus in the boundary waters of the Great Lakes System. The goals of phosphorus control are:

(a) Restoration of year-round aerobic conditions in the bottom waters of the Central Basin of Lake Erie;

(b) Substantial reduction in the present levels of algal biomass to a level below that of a nuisance condition in Lake Erie…

The Phosphorus Control Annex set specific targets for phosphorus load reductions to Lake Erie. It called for cutting annual loading from its 1976 level of 20,000 metric tons per year to 11,000 metric tons. In 2007, Ohio EPA (Ohio EPA) convened its *Ohio Lake Erie Phosphorus Task Force* to determine what practices may have changed since 1995 that could increase dissolved reactive phosphorus loads, and lead to algae blooms. This issue is discussed in **Chapter 2**.

Remedial Action Plans

On November 18, 1987, Annex 2 for Remedial Action Plans (RAP) and Lakewide Management Plans (LaMP) was signed in Toledo, Ohio (IJC, 1989). This Annex defined an "Area of Concern" (AOC) as "a geographic area that fails to meet the General or Specific Objectives of the GLWQA where such failure has caused or is likely to cause impairment of beneficial use or of the area's ability to support aquatic life." Four AOCs are located in Ohio: Ashtabula, Cuyahoga, Black, and Maumee Rivers.

RAPs were undertaken for all forty-three of the AOCs to provide a coordinated cleanup and restoration of impaired beneficial uses of waterways. The GLWQA identifies 14 beneficial uses which may result from "a change in the chemical physical or biological integrity of the Great Lakes System." RAPs were charged with undertaking "…a systematic and comprehensive ecosystem approach to restoring and protecting beneficial uses in Areas of Concern …"

The beneficial use impairments (BUIs) identified by Annex 2 of the Agreement are:

(1) Restrictions on fish and wildlife consumption;

(2) Tainting of fish and wildlife flavor;

(3) *Degradation of fish and wildlife populations;*

(4) *Fish tumors or other deformities;*

(5) *Bird or animal deformities or reproduction problems;*

(6) *Degradation of benthos;*

(7) *Restrictions on dredging activities;*

(8) *Eutrophication or undesirable algae;*

(9) *Restrictions on drinking water consumption, or taste and odor problems;*

(10) *Beach closings;*

(11) *Degradation of aesthetics;*

(12) *Added costs to agriculture or industry;*

(13) *Degradation of phytoplankton and zooplankton populations; and*

(14) *Loss of fish and wildlife habitat.*

The beneficial use impairments apply specifically to the lower Maumee River because it is an AOC. The two other major rivers in the region, the Portage and the Sandusky, are not AOCs. The BUIs also apply to these rivers because they are tributaries of Lake Erie, and BUIs are an issue for the Lake Erie LaMP. The difference for the three rivers is that for the Maumee, an AOC, there is an emphasis on *restoration* of beneficial uses. For the Portage and Sandusky, not AOCs, there is a greater emphasis on *protection* of beneficial uses.

III. Water Quality Policies

Use of Policies

This Plan adopts the following statements as TMACOG policy and guidance to staff. These policies are set to fulfill the goals of the Clean Water Act and the GLWQA at the local and regional level.

The policies set by this Plan should be used for the following purposes:

(1) Set goals for the TMACOG *Annual Work Plan* and committees of TMACOG, subject to approval of the TMACOG Board of Trustees.

(2) Set goals for projects and funding applications to be conducted by TMACOG staff and committees of TMACOG subject to approval of the Chair of the TMACOG Water Quality Council.

(3) Support projects and funding applications of TMACOG members, project partners, and Water Quality stakeholders of the region, subject to the approval of the Chair of the TMACOG Water Quality Council.

(4) Support financial assistance requests through the “A-95” Regional Clearinghouse Review Process. Compatible projects should be recommended to the federal funding agency as “consistent with regional goals,” subject to approval by the TMACOG Executive Committee.

(5) Support federal, state, and local legislation subject to approval by the TMACOG Board of Trustees.

Beginning in 2017, TMACOG members and staff undertook a review of the following Policy and Goal Statements within this chapter and other policies, practices, and partnerships identified by TMACOG's water quality committees. The highest priority policies that need legislative action and funding at the local, state, and federal level were further developed into the Agenda for Lake Erie. The Agenda for Lake Erie is an advocacy document that TMACOG members, water quality stakeholders, and citizens can use to encourage actions that TMACOG members believe will have the greatest impact in addressing Lake Erie's algae issues and will support the work of the local governments that provide water and wastewater services to the region's population. The Agenda for Lake Erie will undergo review and updates every two years in alignment with Ohio's biennial budget cycle. The Agenda for Lake Erie is incorporated into the TMACOG Areawide Water Quality Management Plan in Appendix C.

Policy and Goal Statements

The following policy and goal statements are endorsed by the Plan:

(1) Support Public Wastewater Treatment Infrastructure

- a) Support implementation and funding of public wastewater collection and treatment needs identified in **Chapters 5** and **6** of this Plan.
- b) Assist DMAs, as identified in **Chapter 4** of this Plan, in planning, implementing, and financing sanitary sewage infrastructure.
- c) Coordinate DMAs and provide technical assistance to plan efficient and cost-effective sanitary sewage facilities.
- d) Coordinate DMAs and provide technical assistance to assist in meeting NPDES permit requirements.

(2) Support Federal Assistance for Public Wastewater Treatment Infrastructure Financing

- a) The federal government should participate in funding projects by funding at least a base percent of mandated sewage projects through grant funding. Implementation schedules should be based on available grant funding. Support should be in the form of grants, in preference to loans, using Clean Water Act §201 grants, U.S. Department of Agriculture (USDA) Rural Utility Service, or equivalent mechanisms.
- b) The criteria for an "affordable" sewage project should be based on comprehensive economic factors, rather than a set percentage of median household income. Sewage mandates should take into account the point of diminishing returns, or cost/benefit analysis of environmental benefit for expenditure of money. In particular, the criteria avoid imposing an economic or competitive disadvantage on local businesses.
- c) State Revolving Fund (SRF) loans, if used for economic stimulus, should provide zero percent or negative interest loans to communities.
- d) The federal government needs to be a partner with local governments by providing grant funds for sewage improvements. Communities that do not receive federal grant funds should instead be granted time flexibility on combined sewer overflow (CSO) mandates until a new implementation schedule can be developed based on the redefined "affordability" criteria that account for community economic impact.

e) For sewage projects that result in a financial hardship for residents, TMACOG supports the use of federal Clean Water SRF monies for principal-forgiveness loans which recipients are not required to repay.

f) TMACOG supports reserving 15% of SRF financing for communities of 10,000 or less population.

g) Support State affordability criteria based on income data, population trends, and other data determined relevant by the State, including whether the project or activity is to be carried out in an economically distressed area.

h) Update U.S. EPA guidance, Combined Sewer Overflows-Guidance for Financial Capability, Assessment and Schedule Development (U.S. EPA, 1997):

   i. Greater emphasis on local economic conditions;

   ii. Prescriptive formulas to calculate financial capability should not be the only indicator of the financial capability of a communality;

   iii. Consideration of site-specific local conditions in analyzing financial capability;

   iv. A comprehensive approach to affordability with single measures (such as median household income) viewed in the context of other economic measures, rather than as a threshold to be achieved; and

   v. Consideration to the economic outlook of a community in the development of implementation schedules.

(3) Federal Water Trust Fund to provide funding to the Clean Water and Drinking Water State Revolving Funds

a) Include appropriate funding mechanisms in Water Trust Fund legislation, drawing upon sources independent of current local, state, and federal revenues;

b) Water Trust Fund revenues be designed to be adequate to meet nationwide needs for financing of drinking water and sanitary sewage infrastructure;

c) Water Trust Fund monies be dedicated solely to the planning, design, and construction of water and wastewater infrastructure and used on an annual basis; and

d) TMACOG will review and comment on proposed Water Trust Fund legislation in consultation with the Water Quality Council and Executive Committee and support legislation that consistent with TMACOG's adopted positions.

(4) Support the Water Resource Restoration Sponsor Program (WRRSP) and its continued funding through Ohio EPA’s Water Pollution Control Loan Fund

(5) Reduce Eutrophication and Nutrient Loadings

a) Reduce phosphorus loadings to Lake Erie and achieve targets of the Phosphorus Reduction Strategy;

b) Reduce nitrogen loadings to Lake Erie and its tributaries to control eutrophication and protect drinking water sources; and

c) Support and provide financial assistance for best management practices to reduce nutrient loadings to Lake Erie and its tributaries.

(6) Reduce Sediment Loading and Erosion

a) Support and provide financial assistance for best management practices to reduce erosion and sediment loadings to Lake Erie and its tributaries, and achieve clear water;

b) Reduce sediment loading to the Maumee River to maintain the economic viability of Toledo Harbor and its shipping channel; and

c) Support full state and federal funding for agricultural conservation incentive programs that encourage farmers to preserve floodplains, wetlands, and riparian habitat. Support includes but is not limited to the Conservation Reserve Enhancement Program (CREP).

(7) Disposal/Reuse/Reduction of Maumee River Channel Dredged Material

a) It is imperative for maintenance dredging of the Toledo shipping channel to provide access to the Port of Toledo for the economic benefit of the entire region;

b) Support reduction and ultimate elimination of disposal of Toledo harbor dredged material by discharge into Maumee Bay or Lake Erie;

c) Support measures to beneficially reuse dredged sediment on appropriate upland sites, or to create habitat areas in Maumee Bay or Lake Erie; and

d) Support conservation Best Management Practices (BMPs) throughout the Maumee River basin to reduce the river's sediment and nutrient loading to Lake Erie.

(8) Support Stormwater Management

a) Coordinate and provide technical assistance to local governments to fulfill NPDES Stormwater permit requirements efficiently;

b) Support and provide financial assistance for stormwater best management practices on a watershed basis; and

c) Reduce pollutant loadings to streams from stormwater runoff, including nutrients, sediment, pesticides, oil, and metals.

(9) Protect Natural Habitat

a) Preserve, protect, and restore wetlands and natural habitat areas;

b) Recognize high priority areas for protection and restoration of natural habitat:

   i. The Oak Openings

   ii. The Maumee Bay South Coastline

c) Preserve, protect, and, where needed, expand floodplains and their stormwater storage capacity for the prevention of flooding and to provide riparian or aquatic habitat;

d) Support voluntary, compensated acquisition of natural areas for the purpose of preservation or restoration by governmental or non-profit agencies; and

e) Support recreational use of and public access to waterways and natural areas where they do not endanger the natural habitat.

Oak Openings Region

The region's single most important natural habitat area is the Oak Openings region. The Maumee RAP calls for preservation and acquisition of fish and wildlife habitats, specifically recommending wet prairies and oak savannahs of western Lucas County, in the Oak Openings area. The *Swan Creek Plan of Action* gives its highest priority to preserving floodplains and wetlands as natural habitats.

The Oak Openings Region, located within portions of the Swan Creek and Ottawa River watersheds, is a 130-square mile area supporting globally rare oak savanna and wet prairie habitats. It is home to more rare species of plants and animals than any other area of Ohio. Its trees, plants, sandy soils, wet prairies, and floodplains benefit the region by acting as natural filters for our air and water.

Natural floodplain corridors occur between the Oak Openings Region and Lake Erie along the Maumee River, Swan Creek, and Ottawa River. Preserved natural floodplains in these areas help to balance the effects of development and the resulting downstream effects of increased urban runoff. Floodwater is slowed within the broad forested areas of the floodplain allowing for groundwater replacement, and evaporation to take place.

The Oak Openings Region with its wet prairies and savannas, together with the connecting corridors along the Maumee River, Swan Creek, and Ottawa River should be given the highest priority for preservation. By maintaining the natural character of these areas, they will continue to benefit humans, and wildlife, long into the future.

For these reasons, this Plan recognizes the Oak Openings region as a sensitive and unique habitat area and recommends it as a priority area for protection and restoration of habitat. Additional areas may be recognized by this Plan upon based on recommendation of the affected watershed council.

Maumee Bay South Coastline

This plan recognizes coastal natural areas as important habitat. They may include wetlands, but also provide shoreline habitat and natural beauty for both recreation users and residents. This plan identifies the south coast of Maumee Bay from the east side of the mouth of the Maumee River to Little Cedar Point within the boundaries of Ohio's Critical Coastal Area (ODNR, 2000).

(10) Support the Clean Ohio Fund

- a) Supports State of Ohio funding for the Clean Ohio Fund; and
- b) Requests that the Ohio General Assembly take appropriate steps to authorize Clean Ohio Fund funds, including but not limited to legislation or placing continuation of the Clean Ohio Fund on a statewide ballot measure.

(11) Support Removal of Drainage Obstructions on the Portage River

- a) Support removal of logjams that are causing localized flooding problems and removal of individual leaning trees that are likely to cause or contribute to future logjam obstructions;

b) Encourage the Boards of Commissioners of Wood, Hancock, and Seneca Counties to direct any obstruction removal projects to be designed to minimize disturbance of riparian habitat or removal of vegetation that does not currently or likely to form logjams; and

c) Support comprehensive, impartial watershed studies and research on all sources and impacts of flooding on the Portage River analyses conducted under the auspices of appropriate governmental agencies.

(12) Support Healthy Fish and Wildlife Communities

a) Eliminate consumption advisories for fish from Lake Erie and its tributaries in the TMACOG region;

b) Sustain and increase fish populations of Lake Erie and its tributaries, both for number of fish and diversity of species. Reduce fish kills in power plant intakes. Consider the walleye as our primary indicator species;

c) Sustain and increase wildlife populations of the region. Consider the bald eagle as our primary indicator species; and

d) Restore and sustain a healthy benthic macroinvertebrate community to streams of the region.

(13) Reduce Pesticide Loadings to Lake Erie and its Tributaries

a) Support best management practices for use of pesticides, both for agricultural and residential purposes; and

b) Support reduced use of pesticides and use of less persistent pesticides.

(14) Eliminate Persistent Toxic Chemicals

a) Support remediation of land and stream sediments contaminated with persistent toxic chemicals;

b) Support the GLWQA goal to virtually eliminate discharges of toxic substances in toxic amounts; and

c) Support funding and implementation of pollution prevention programs.

(15) Reduce Bacterial Contamination

a) Reduce fecal bacterial loadings to Lake Erie, its tributaries, and their sediments to provide for safe water recreation throughout the bathing season;

b) Reduce discharges of fecal bacteria and pathogens in wastewater effluent and surface runoff to protect human health and meet recreational use designations of water quality standards;

c) Support and require replacement of onsite sewage treatment systems by public sewers wherever practicable;

d) Promote and require proper operation and maintenance of onsite sewage treatment systems in areas where it is not practicable to replace them with public sanitary sewers;

and

e) Eliminate swimming or wading advisories for Lake Erie and its tributaries in the TMACOG region.

(16) Support Ohio Legislation and Regulations for Onsite Sewage Treatment Systems

a) Base the definition of "ponding" as a legal nuisance [ORC §3718.011(B)] on evidence of repeated or persistent ponding;

b) Provisions regulating vertical separation distances between onsite sewage treatment systems and limiting soil layers should allow use of mounded systems and avoid requirements for mechanical pretreatment equipment;

c) Support regulations allowing design of subsurface drains ("curtain drains") to be installed at shallow enough depths to drain by gravity where feasible;

d) Support a consistent, risk-based methodology for determining seasonal high-water table as a limiting condition and the basis for a vertical separation distance from the soil absorption system;

e) Encourage onsite sewage treatment designs to provide effective sewage treatment in the soil conditions of northwest Ohio with a minimum of mechanical equipment; and support research and demonstration projects for such designs; and

f) Support grant and revolving loan programs to help low income residents afford onsite sewage system repairs and replacements.

(17) Animal Feeding Operations (AFOs)

a) TMACOG is neither pro-AFO nor anti-AFO, but stresses that siting, permitting, and operation of AFOs must be fact-based, and founded on sound science and effective BMPs for protection of the environment and public health;

b) Support comprehensive, impartial watershed studies and research on all sources and impacts of pollutants, potential impacts on the quality of surface and ground water from application of manure to agricultural fields, impacts to air quality and monitoring of pests related to AFOs;

c) Support funding proposals for studies, research, demonstration projects, and implementation related to BMPs related to AFOs;

d) Support use of Comprehensive Nutrient Management Plans as a BMP for using manure as an agricultural resource;

e) Support AFO siting criteria that take into consideration soil conditions and geology, avoiding water and gas wells, and proximity to residential areas;

f) Recommend studies of infrastructure (especially road) impacts, and infrastructure improvement and maintenance costs resulting from the establishment, expansion, and operation of AFOs; and

g) Recommends against siting AFOs within the bounds of 100-year floodplains.

(18) Control Invasive Species and Prevent Introduction of Additional Invasive Species

a) Support comprehensive federal legislation to prevent the introduction and spread of aquatic invasive species from all sources, ultimately eliminate the introduction and spread of aquatic invasive species from ballast water discharged into the Great Lakes.

(19) Exclude Invasive Asian Carp Species from the Great Lakes

a) The U.S. Army Corps of Engineers (USACE) should aggressively expedite full operation of the dispersal barrier system and to establish structural measures to prevent the inadvertent introduction of Asian carp from floodwaters of the Des Plaines River into the Chicago Sanitary and Shipping Canal;

b) Federal agencies should take every action necessary and possible to keep Asian carp out of the Great Lakes, including closing the two Chicago locks; chemical controls; increased monitoring (DNA) and speed up test processing; building additional barriers; finishing the electric barrier system and operating it at optimal power; and the construction of hydrological barriers to prevent overflow (flooding) exchange between the Illinois and Des Plaines River basins, the Illinois and Michigan Canal, and the Chicago Sanitary and Ship Canal;

c) The most effective solution for the health of both the Mississippi River and Great Lakes watersheds is separation, barring migration of invasive species, and that this goal must start with investigation to identify alternatives for existing uses of the Chicago Sanitary and Shipping Canal, including for stormwater and wastewater control and commercial and recreational navigation; and

d) Congress should reinforce the authority for and provide funding to the USACE and other federal agencies to develop a specific plan of how to hydrologically separate the Mississippi River and Great Lakes basins to prevent further migration of any Asian carp and to continue aggressive monitoring and response efforts in Chicago-area waterways.

(20) Support and Conduct Water Quality Education Programs for General Public and Target Groups

(21) Support Beneficial Uses identified by GLWQA

a) Support restoration and protection of beneficial uses in the Lower Maumee River AOC; and

b) Support protection of beneficial uses in the rest of the TMACOG, and restoration where needed.

(22) Protect Groundwater for a Safe, Reliable, and High Quality Source of Potable Water

(23) Protect Surface Drinking Water Supplies through Watershed Programs such as Source Water and Assessment Protection (SWAPs) Plans

(24) Support Protecting the Waters of the Great Lakes against bulk diversions outside the watershed

a) TMACOG encourages the Ohio and Michigan to continue the process of the Great Lakes Basin Water Resources Compact and the Great Lakes Basin Sustainable Water Resources Agreement; and

b) Supports Compact language that does not impose unnecessarily rigid water use restrictions for municipal water supplies.

(25) Support Preparation of Total Maximum Daily Load (TMDLs) assessments for watersheds of the region

(26) Support water Quality Monitoring and Assessment to track progress in achieving these environmental policies

References

International Joint Commission (IJC), 1989. Great Lakes Water Quality Agreement of 1978 as Amended by Protocol Signed November 18, 1987.

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U.S. Environmental Protection Agency (U.S. EPA), 1997. Combined Sewer Overflows-Guidance for Financial Capability Assessment and Schedule Development. http://www.epa.gov/npdes/pubs/csofc.pdf

Water Pollution Control Federation, 1982. The Clean Water Act with Amendments

Chapter 5: Public Wastewater Treatment

I. Introduction

Clean Water Act

On October 18, 1972, the Federal Water Pollution Control Act Amendments became Public Law 92-500. These amendments established a comprehensive water pollution control program. The Act's objective was to *"restore and maintain the chemical, physical, and biological integrity of the Nation's waters."* It established programs to carry out these goals:

- Uniform, enforceable national standards for clean water and regulations to enforce those standards;
- A national permit program for discharge from all point -sources industrial, municipal, commercial, agricultural, and other facilities that release pollutants through pipes and -sewers;
- Federal funds for construction of sewage treatment systems;
- State and areawide water quality planning programs to coordinate pollution control decisions and to implement feasible methods to achieve clean water over the long term.

The Clean Water Act (CWA) was reauthorized and amended in 1977, 1982, and 1987. Among the many changes were to shift responsibility for management and funding from the Federal Government to State and Local agencies. In the 1970s, the *Areawide Water Quality Management Plan* (AWQMP) was used for issuing Construction Grants for public sewers and wastewater treatment under §201 of the CWA. Today, the Construction Grants have been replaced with Revolving Loan programs administered by Ohio EPA and Michigan EGLE. U.S. EPA provides the working capital for these programs through grants. Each State provides matching funds and loans the money to local governments to build or upgrade public sewage systems. Both State agencies have reduced interest rate funding available for projects based on financial need.

The Purpose statement of §201 states that: *"To the extent practicable, waste treatment management shall be on an Areawide basis and provide control or treatment of all point and non-point sources of pollution, including in place or accumulated pollution sources."* This goal remains relevant despite the declining Federal role.

II. An Areawide Approach to Public Wastewater Treatment

Facility Planning Areas

Section 208(a)(2) of the CWA directs that: *"The Governor of each State ... shall identify each area within the State which, as a result of urban-industrial concentrations or other factors, has substantial water quality control problems."* This language led to the establishment of Facility Planning Areas (FPAs) as a key element of this Areawide Water Quality Management Plan (AWQMP). An FPA may cover a municipality and surrounding developed areas, or areas where public wastewater treatment may be provided more economically or more effectively at a regional level than for each individual political jurisdiction. FPAs provide individual jurisdictions with a means of planning and cooperation to provide service to residents.

Service includes collection of household sewage in pipelines that carry it by gravity and pumping to a "wastewater treatment plant" (WWTP), which may also have a limited ability to treat industrial wastes and/or sludge pumped out of private septic tanks (septage). The term WWTP may also be applied to treatment facilities owned and operated by industries solely for their own process wastes; but in this Plan it normally refers to a municipal facility. The entire system of pipes, fittings, valves, pumping stations, and treatment facilities is called a sewage system. A Publicly Owned Treatment Works (POTW) refers specifically to a sewage treatment plant operated by a County, a municipal government, or a sewage authority.

This chapter of the Plan defines the region's FPAs—both physical boundaries and their application. FPAs are a mechanism for predicting future wastewater collection and treatment needs, and planning facilities to meet them. The FPAs also define the service areas of the designated treatment facilities for purposes of ORC. §6111.03(J)(2)(B).

For FPAs where there is an existing sewage system, population forecasts corresponding to the FPA boundary allow pipelines, pumping facilities, and treatment equipment to be sized to provide wastewater treatment and meet National Pollutant Discharge Elimination System (NPDES) permit requirements for the next 20 years. For areas where there is no existing sewage system, the FPA predicts future needs to help select the best means of providing service to the area.

Regional Wastewater Management Issues

Several wastewater problems or issues are common throughout the TMACOG region. These issues are often referred to in the descriptions of individual FPAs and discussed here to give the reader a general understanding.

Extraneous Flows

Infiltration and Inflow: Perhaps the single greatest problem experienced by WWTPs throughout the region is that of infiltration and/or inflow (I/I).

- ***Infiltration*** refers to extraneous water entering a sewer system below the ground. It includes leaking service connections - for example, from defective pipes, joints, connections, or manholes.
- ***Inflow*** refers to extraneous water entering a sewer system above ground through improper openings or connections. It includes catch basins, yard drains, and downspouts hooked into the sanitary sewer instead of a storm sewer; it also includes surface water getting into the sewer through a manhole cover.

Both sources of excess water overload sewers and interfere with the treatment plant's ability to do its job. The excess flow overloads the hydraulic capacity of the WWTP, resulting in by-passes of untreated wastewater during storm events. This issue becomes a critical factor when expansion of a WWTP is proposed due to growth when that growth could be accommodated by the present facility if the problem of infiltration was solved.

Anti-Degradation

U.S. EPA set anti-degradation policy in 40 CFR 131.12 (40 FR 51400 November 8, 1983), stating:

> *"The State shall develop and adopt a statewide anti-degradation policy and identify the methods for implementing such policy ... consistent with the following:*

"Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected."

A new package plant with a discharge to a local stream would come under anti-degradation requirements, especially where public sewers are available or proposed. In such a case the issue is whether a Permit-to-Install (PTI) ought to be issued to allow the package plant, or whether a sewer extension ought to be built instead.

Extensions of existing sanitary sewer systems often come under anti-degradation regulations. This happens when extraneous stormwater overloads the sewage system, resulting in bypasses or untreated or incompletely treated sewage. Ohio EPA policy requires elimination of extraneous flows as a condition of the PTI. Usually there is a removal multiplier-requirement: e.g., three gallons of extraneous flow must be eliminated for every gallon of sanitary sewage to be taken on by the system. Michigan EGLE has similar regulations for removal of extraneous stormwater flows, but not through anti-degradation rules.

It is the recommendation that anti-degradation requirements for extraneous flows be consistent and based on a defined storm and removal multiplier.

Industrial Discharge Pre-Treatment

Industrial pre-treatment is treatment of wastewater by an industrial facility before it discharges to a WWTP. Pre-treatment removes industrial wastes that the WWTP was not designed to treat. Industrial wastes can create problems in sewers (e.g., fire, corrosion, or explosion), inhibit municipal sewage treatment processes, and pass into the environment by accumulating in the POTW's sludge. Industrial pollutants causing any of the above problems are incompatible with the POTW, and, if industry is to discharge into the public system, industrial effluent will require pre-treatment before entering the system.

Under a pre-treatment program, the State and the public sewage system can require the industry to treat its wastewater to set standards before discharging it to the public sewer. Pre-treatment programs have eliminated many separate industrial wastewater discharges throughout the region.

Package Wastewater Treatment Plants

In many unsewered areas, privately owned treatment plants are used for sewage disposal. The most commonly used type of facility is the *extended aeration* treatment plant, which works on a principle similar to the *extended aeration activated sludge* process used in municipal sewage treatment. These small "package" extended aeration treatment plants are manufactured in prefabricated modules, purchased and installed as a "package." The term "package plant" as used in this plan includes, all publicly and privately owned, sewage treatment plants serving businesses or residential uses with more than three families. The great majority of these systems are extended aeration plants, but the term as used in this plan and policies includes lagoons, trickling filters, Imhoff plants, and other mechanical sewage treatment devices. It does not include commercial septic systems.

Package plants typically range in design capacity from 1,500 to 100,000 gpd. They are used by commercial operations in unsewered areas when the amount of sewage is too great for disposal by a septic tank/leaching field system and/or where soil conditions won't permit a leaching field to operate properly. Package plants are commonly found at gas stations, restaurants, motels, mobile home parks, subdivisions, marinas, rest areas, schools, retail stores, and occasionally at private residences in outlying areas. Often, there is a high concentration of package plants just outside a city's sanitary sewer service area.

Frequently these facilities are not properly operated or maintained. In Ohio, all dischargers are required to have NPDES permits. In Michigan, all surface water discharges are required to comply with NPDES permits. Package plant owners are often reluctant to tap into a public sewer because they made a substantial investment in the package plant.

Wastewater Sludge Management

Sludge is the solid or slurry byproduct produced in the treatment of water or wastewater. Sewage is treated using a biological process: microorganisms remove organic matter from sewage by digesting it. In the process, the microorganisms grow and reproduce. Over time, it is necessary to remove excess microorganisms from the treatment plant - these excess microorganisms are referred to as "waste activated sludge."

Waste sludge undergoes further organic digestion creating biosolids. It may also be dewatered, changing a large volume of slurry into a much smaller volume of biosolids.

Biosolids may be disposed of in one of four ways:

- Incineration
- Placement in a sanitary landfill
- Application to agricultural land
- Hauling to another NPDES permitted facility

Application to agricultural land is the most common practice in the TMACOG region, and it is the recommendation of this plan that land application be the preferred alternative. Incineration and land filling are simply disposal, discharging pollutants to the air, soil, and possibly waterways.

Land application recycles nutrients and organic matter in biosolids by returning it to agricultural land. Land application and beneficial use is regulated by Ohio EPA under Ohio Administrative Code (OAC) 3745-40 and Michigan EGLE under Part 503 of Chapter 40 of the Code of Federal Regulations.

In Ohio, the regulatory controls on land application of biosolids are extensive. The treatment, storage, transfer, and beneficial use of biosolids must be in compliance with the conditions of OAC 3745-40 and the conditions of an NPDES permit or an approved sludge management plan before a wastewater facility may land apply biosolids. The facility will treat and beneficially use biosolids in such a manner as to meet regulatory requirements. Biosolids application is limited by its nutrient and pollutant concentrations. Other regulations control the methods and locations of biosolids application to prevent runoff, contamination of surface or groundwater, or becoming a nuisance while stockpiled.

Biosolids are classified as Exceptional Quality (EQ) or Class "B" depending on the treatment processes used for pathogen reduction and vector attraction reduction and pollutant concentration sampling results. EQ biosolids receive a higher degree of treatment and as a result, fewer restrictions apply to its land application.

In 2020, TMACOG staff in consultation with the TMACOG Wastewater Committee completed a literature review and white paper titled *Biosolids: Land Application of Treated Wastewater Byproducts.* The paper provides an overview of biosolids treatment processes, land application methods and benefits, and potential human and ecological impacts. The paper also describes the federal, state, and local regulatory environments for biosolids applications and identifies areas where additional research is needed. The paper is included in the TMACOG 208 Plan as Attachment D.

III. Areawide Policies

Designated Management Agencies

For each FPA, one or more Designated Management Agencies (DMAs) are listed. DMAs have local responsibility for facility planning and requesting Plan Amendments as necessary. Each DMA's responsibility for collection and/or treatment of sanitary sewage is described later in this chapter in the descriptions for each facility planning area, and in the DMA table in **Chapter 4**. DMAs are responsible for planning and financing facilities needed to carry out their role, and all DMAs are responsible for cooperating in planning sewage systems that involve multiple DMAs. Typically, the DMA is the County or municipality that owns and operates the central WWTP, but not always. In cases where an FPA does not include a treatment plant, the DMA is typically the entity responsible for building, operating, and maintaining the sewers.

The DMA's role includes:

- Preparing Facility Plans or sewage studies to meet Ohio EPA or Michigan EGLE requirements and this Plan's water quality goals.
- Serve as lead applicant to arrange financing for the construction of needed sewerage improvements.
- Join into service agreements with other political jurisdictions within the FPA to operate and maintain sewers, administer billings, and other activities for system operation.
- Request AWQMP amendments as necessary. Where a conflict arises among the jurisdictions of an FPA, any political jurisdiction may request a plan amendment. TMACOG encourages neighboring governments to resolve sewage service conflicts through a collaborative process. If the affected jurisdictions are unable to resolve conflicts regarding an amendment to TMACOG's plan through a collaborative process, then these issues will be resolved by TMACOG's Board of Trustees' vote on the plan amendment, which is TMACOG's final decision on the matter.
- The Water Quality Council reviews the Ohio EPA and Michigan EGLE revolving loan fund priority lists and makes any necessary recommendations to achieve the water quality goals of the region.
- DMAs cooperate with the Water Quality Council in the Plan Amendment and updating process.

Package plants may be permitted in areas of FPAs where public sewage service is not available.

Facility Planning Area Descriptions and Data

The largest part of this chapter is devoted to discussing each FPA individually. Each FPA description addresses, where applicable, the following:

- A map showing its boundaries, areas presently served with public sanitary sewers;
- Estimated population in the FPA and in areas not presently served by public sanitary sewers;

- Description and capacity of current sewage facilities, including known package plants, regardless of whether they are presently in use;
- Discussion of sludge treatment and disposal practices, and availability of septage treatment services;
- Industrial wastewater pre-treatment services, policies, and capacity;
- Discussion of the adequacy of sewage facilities to achieve the water quality goals; and
- Recommends needed facility improvements to meet the water quality goals. Examples of these improvements include sewage treatment capacity expansion or upgrades, abatement of combined sewer overflows, elimination of stormwater from sanitary sewers, elimination of package plants, or extension of public sewage service to presently unsewered areas.

Facility Planning Area Policies

The FPAs were first defined in the §201 Facility Plans, most of which were prepared between 1974 and 1985. Facility Plans were detailed engineering studies of the most cost-effective means of complying with CWA wastewater treatment requirements. The Facility Plan weighed the costs and benefits of various types of sewers and wastewater treatment plants, reaching a final recommendation. The recommendation was used as a funding request for a Construction Grant under §201 of the CWA

The AWQMP consolidates and updates the Planning Areas originally collected from the Facility Plans. This Plan supersedes the FPA boundaries in the Facility Plans and provides the local governments with a means of fostering cooperation between neighboring Planning Areas.

Generally speaking, an FPA is a current or proposed sanitary sewer service area. In most cases, the FPA has a central wastewater treatment plant. In some cases, the FPA is a discrete service area whose wastewater is treated by a neighboring plant. In such cases, a regional approach to wastewater treatment was found to be more cost-effective and/or more environmentally beneficial than a separate wastewater plant.

For the remaining unsewered FPAs, whether to build a new treatment plant or join an existing facility is a key decision, based on:

- Ability to protect public health and produce effluent that will not compromise the receiving stream's water quality
- Lowest cost to users
- Feasibility of providing service

Planning areas provide Ohio EPA and Michigan EGLE and local governments with a decision-making tool for the construction of public sewers. It is the policy of this Plan that:

- A residence or business within an FPA that generates sewage or produces an effluent from treated sewage, sewage sludge, or septage shall connect to that FPA's sewage system if the sewer is available and accessible.
- Ohio EPA and Michigan EGLE may approve sanitary sewer extensions proposed within FPAs if they are consistent with this Plan.
- Areas outside FPAs should be reserved open space, farmland, or low density residential. "Low

density residential" is here considered development that is sparse enough to provide on-site sewage treatment according to the policies laid out in the **Chapter 6** of this Plan. Public sanitary sewers should not be extended to areas outside FPAs. Where a road is an FPA boundary, properties immediately adjacent to either side of that road may be served, as noted below under "Land Use Planning."

- If a DMA proposes serving an area outside its currently established Facility Planning Area, it may request a Plan Amendment as described in **Chapter 4**.
- Once an area has sanitary sewage service as part of an FPA, it shall continue to be served by that wastewater facility, except:
  - When the wastewater facility is no longer able to meet its NPDES permit requirements due to extraneous water, unanticipated growth, or treatment quality problems.
  - By mutual agreement of the affected DMAs.
- Package plants within FPAs shall not be permitted where a public sewer is "available" under applicable state or local regulations. Availability of public sewers is determined by the DMAs responsible for providing sanitary sewage service at the location in question. In Ohio, Ohio EPA makes a determination whether or not to require connection to a sanitary sewer when the PTI is approved. The policies of this plan are as follows:
  - New or existing package plants shall be permitted inside FPAs only where public sewers are not available.
  - NPDES permits shall be required for all package plants regardless of their size.
  - All PTIs and NPDES permits for new or existing package plants shall be required to tap when public sewers become available.
  - No PTI or NPDES permit shall be issued for a new or existing package plant where a public sewer is available.
  - No PTI or NPDES permit shall be issued for a new, expanded, or upgraded package plant where making a public sewer available would cost the same or less than the cost of the new, expanded, or upgraded package plant.
  - No NPDES permit shall be granted or renewed for either a new or existing package plant where a public sanitary sewer is available.
- Under this Plan, a package plant is inherently a temporary sewage treatment facility, to be used only until such a time as public sewage service becomes available. As a temporary facility, a package plant does not require an FPA. In some cases, a small prefabricated extended aeration wastewater treatment plant is owned and operated by a DMA as a permanent facility. In such a case, the plant is considered a POTW, requiring an FPA, for which it is the principal wastewater treatment facility.
- On-site sewage treatments systems serving individual residences and businesses shall not be permitted within an FPA where a public sewer is available and accessible. Where sewers are not available and accessible within an FPA, on-site systems shall be permitted, subject to policies set in **Chapter 6**.

Considerations for Setting FPA Boundaries

The CWA calls for an areawide approach to water quality management, originally used to foster areawide cooperation in wastewater treatment: *"...shall identify each area within the State which, as a result of urban-industrial concentrations or other factors, has substantial water quality control problems..."* This very broad language takes on a new meaning with the elimination of most point source pollution problems, and the recognition that water quality control is now dependent on nonpoint source pollution and aquatic habitat.

The guiding principles used in delineating FPAs under this plan are:

1. FPAs must be in compliance with the CWA requirements, notably
   a. "Waste treatment management shall be on an Areawide basis." [Clean Water Act §201(C)]
   b. "Identification of those areas which, as a result of urban-industrial concentrations or other factors have substantial water quality control problems." [Clean Water Act §208(A)(2)]
2. FPAs should use sound planning practices to identify future needs for wastewater collection and treatment facilities. An FPA boundary is a planning area for a single specific present or future wastewater plant as well as a service area for the designated wastewater treatment plant. An FPA may include service areas for multiple treatment plants when those plants are interconnected to treat varying flow rates.
   a. FPAs should be compact and contiguous concentrations of urban land uses without islands of one FPA surrounding another.
   b. Remote service areas may be included in an FPA when connected by force main and separated by areas that should remain un-urbanized.
   c. FPAs should be designed to serve residents in the most cost-effective manner without duplication of service.
   d. FPA boundaries should be consistent with adopted local land use plans.
   e. FPA boundaries should be developed through cooperative dialogue among affected local jurisdictions. TMACOG encourages neighboring governments to resolve sewage service conflicts through a collaborative process. If affected local jurisdictions are unable to resolve conflicts regarding an amendment to TMACOG's plan through a collaborative process, then these issues will be resolved by TMACOG's Board of Trustees' vote on the Plan Amendment which is TMACOG's final decision in the matter.

IV. Land Use Planning and Sewage Facility Planning

Land use planning is inseparable from planning sanitary sewers service areas. The availability of public sewers is necessary for urban development, especially in a region where soil conditions are very often unsuitable for on-site sewage disposal. With urban development comes pollution from urban runoff, drainage of wetlands, and loss of farmland. A link between established land use plans and sewer planning allows local governments to anticipate infrastructure needed for growth, rather than reacting to water pollution problems.

Land use plans, zoning, and the AWQMP are closely related and are coordinated through the TMACOG Transportation and Water Quality Councils. The FPAs are based on county and local land use, comprehensive, or master plans. Areas designated for urban development by these plans have been included within FPA boundaries. Where a sewer is built along a boundary road, it makes sense to serve both sides of the road. Land use and development policies should be applied to FPAs with this level of detail in mind. This Plan's policy is a sewer extension be approved:

- When a developed area is outside an FPA but contiguous to it, and
- Sewers in the FPA are close enough to be considered "available" under the applicable Ohio State law or local ordinance in Michigan.
- When sewers are extended outside an FPA, the FPA boundary should be amended to include the served area.

Zoning is the local government's tool for implementing its land use plan. Since zoning controls what is built, and where, it is important for zoning and this Plan to support each other. FPAs and the information they contain are an integral part of land use planning. In deciding an area's future land use, it is essential to ask whether sewage facilities will be adequate to provide service:

- Is the collection system adequate to handle the planned growth?
- Does the wastewater treatment facility responsible for providing service to the area have capacity for the planned growth?
- How much growth is projected for that wastewater treatment facility in the land use plans and zoning of other jurisdictions in its service area?
- Does the FPA's sewage system have problems with sewer overflows, or extraneous stormwater entering the sewers? Will it be necessary to remove stormwater flows from the system in order to handle sanitary sewage due to planned growth?
- What will the ultimate development density be? If an area is developed as low-density and sewers are sized accordingly, the sewers may become overloaded if the density is increased in the future.

Privately-Owned Septage Pretreatment Facilities

Septage is sludge removed from individual septic systems. Unlike waste activated sludge from a wastewater plant, septage has not been stabilized by a treatment process, nor has it been dewatered. As its name implies, septage is anoxic, and can have a strong septic odor.

Disposal of septage is addressed in **Chapter 6**. There are several options, including disposal in a landfill or application to agricultural land. Taking septage to a landfill is disposal, a means of getting rid of it, but does not recycle the nutrients. Agricultural application is not accepted except under strict controls and is banned in some counties. Besides odor issues, land application of septage has potential exposure of pathogens to vectors and can pollute surface water if not properly incorporated into the soil.

A third septage option is discharge to a POTW. A large volume of this high-strength waste, anoxic waste can disrupt the activated sludge treatment process, in addition to causing odor problems. Most POTWs do not accept septage for these reasons. A relatively small number of the larger facilities with capacity/facilities to handle septage do accept it.

A septage pretreatment facility may be designed specifically for this waste stream. A septage pre-treatment facility would treat it, producing two waste streams. First, treated liquid effluent that would be discharged to a POTW for final treatment, second, it would produce stabilized sludge, subject to EPA "Part 503" regulations.

The policy question is whether a privately-owned septage pre-treatment facility duplicates a public investment in a POTW. In most cases, it does not. In areas outside FPAs, and in FPAs that do not include restrictions, privately-owned septage pretreatment facilities may be permitted. In cases where POTWs provide septage receiving facilities and have adequate capacity, restrictions on private septage pre-treatment facilities may be stipulated in the FPA description. If no restriction is mentioned in the FPA description, they may be permitted.

Plan Amendment Process

This Plan is subject to regular updates as conditions change. Any changes are reviewed and enacted through the TMACOG Water Quality Council, which has been charged with responsibility for maintaining the §208 Plan. The Water Quality Council, through its operating procedures, provides representation throughout the region, including a seat reserved for each County and the City of Toledo. DMAs recognized by this Plan may request a Plan Amendment. Please refer to **Chapter 4**, Water Quality Management Framework for detail.

V. State and Federal Programs

Overview

The goal of this Plan set by the CWA is to clean up rivers, streams, and lakes so that they can support fish and other aquatic life and be used for swimming. Once achieved, the goal is to keep the waters from becoming polluted again. Policies to carry out these goals are set by U.S. EPA and implemented by the State regulatory agencies, Ohio EPA, and Michigan EGLE. The main programs are described below.

Water Quality Standards and Regulations

Section 303 of the CWA provides that States are to adopt Water Quality Standards to serve as goals. These standards set "use classifications," for waters of the state, water quality criteria to support those uses, and an anti-degradation policy.

Effluent limitations are established as the maximum allowable rate of discharge, concentration, or amount of a pollutant that may be released from a point source into any body of water.

The level of treatment required is based on a *wasteload allocation*. The wasteload allocation assesses treatment responsibility to all sources discharging into a given stream so that each assumes an equitable share. Ohio EPA and Michigan EGLE have the responsibility of preparing these allocations.

National Pollutant Discharge Elimination System Permits

The NPDES was established under Section 402 and is a principal enforcement mechanism for regulating point source discharges, including those from municipal wastewater treatment plants. The NPDES permit contains several significant items that affect the planning and operation of POTWs such as the effluent limitations. The degree of treatment to be achieved is defined by the effluent limitations developed by the Ohio EPA or the Michigan EGLE. The specific effluent limitations vary with the nature of the receiving waters. The effluent limitations directly influence the type of treatment process, physical treatment works, and the operational efficiency required and are, therefore, of considerable importance.

The NPDES permit also contains limitations, conditions, or schedules that can require the municipality to undertake the construction, upgrading or expansion of its WWTP. Meeting the treatment and time requirements of the NPDES permit is often the stimulus for a community to participate in water pollution control programs.

State Revolving Funds Capitalization Grants

In 1987, Amendments to the CWA (P.L. 1004) began phasing out Construction Grants in favor of State Water Pollution Control Revolving Funds (SRFs) that are to be used by the State to help finance construction of wastewater treatment facilities and programs. These programs are administered by Ohio EPA and Michigan EGLE using priority systems to determine the use of funds.

Facility Plans and Sewerage Studies

Facility Plans and sewage studies are two types of reports used to identify and request approval and funding for sewage facilities.

The Facility Plans were extensive planning documents of prescribed format. They were a required step for funding of Construction Grants under §201. A **Facility Plan's** purpose is to weigh the alternatives for sewage service in an area, and recommend the best, most cost-effective solution. A **General Plan** (Ohio EPA) or a **Detailed Engineering Report and Basis of Design** (Michigan EGLE) are more commonly used today. The evaluation of alternatives is less rigorous; it is a statement from the local jurisdiction of how it intends to comply with its NPDES Permit and show a feasible financing plan.

State and Areawide Planning

There are planning programs for publicly owned wastewater treatment services, at the State level and at the Areawide level. The State programs are carried by Ohio EPA and Michigan EGLE, while TMACOG is the designated Areawide agency.

State Level Planning: The States were given several planning responsibilities under the CWA.

1. The identification of relationship, linkages and strategies for programs authorized by the CWA, the Resource Conservation and Recovery Act and the Safe Drinking Water Act;
2. Construction Grant and Revolving Loan Fund management;
3. Administration of the permits programs;
4. Water quality management planning and certification;

5. Water quality standards development, review and revision;
6. Enforcement, including compliance assurance activities.

Areawide Water Quality Planning: The object of Areawide Water Quality Planning under Section 208 of the *Clean Water Act* is to develop a comprehensive program(s) for the collection and treatment of water and for controlling water pollution from all point and nonpoint sources. TMACOG, as the regional 208 planning agency, has developed an areawide strategy for the responsibilities for pollution abatement of participating jurisdictions in the region.

- Establish and maintain an areawide policy decision-making forum to oversee implementation of the 208 Areawide plan and resolve conflict that may arise among participants in the 208 Areawide plan. Implement changes in the *Areawide Water Quality Management Plan* following the amendment process defined in **Chapter 4** of this Plan.

LUCAS COUNTY FACILITY PLANNING AREAS

Last Updated, 2024

Lucas County Facility Planning Area

The Lucas County Facility Planning Area (FPA) is a designated area within Lucas County (Ohio) and Monroe County (Michigan), where wastewater management, including sewage treatment, is planned and coordinated. It defines the specific areas that are expected to be serviced by wastewater treatment facilities (Figure 5.1.) These areas are carefully planned to ensure that wastewater infrastructure meets the needs of the local population, while also addressing environmental concerns, regulatory requirements, and long-term sustainability. Designated management agencies (DMAs) are the local agencies responsible for management of treatment plants and wastewater collection infrastructure

Designated Management Agency Responsibilities:

- **Lucas County**: Owns and operates the Lucas County Water Resource Recovery Facility (WRRF) and sanitary sewers in the unincorporated areas of Lucas County and various other communities by agreement. The WRRF provides treatment services to all or part of the following communities in the Lucas County Facility Planning Area
    - **Whiteford Township (Michigan):** Owns and operates sanitary sewers in Whiteford Township areas served by Lucas County. Whiteford Township has a 40-year agreement with the City of Sylvania for sewage collection capacity of 125,000 gallons per day (gpd) for Service Area #1 (south of Sterns Road) and 120,000 gpd for Service Area #2 (Ottawa Lake).
    - **City of Sylvania:** Owns and operates sanitary sewers within its service area and has reserved allocated capacity in the WRRF through an agreement with Lucas County. Sylvania transports wastewater from Whiteford Township, Michigan for treatment by the WRRF, under contract with the Whiteford Township Trustees.
    - **Village of Holland**: Owns sanitary sewers within its corporate limits, which are operated by Lucas County through an agreement with the Village.
    - **City of Maumee**: Owns and operates sanitary sewers within its corporate limits, has reserved allocated capacity in the WRRF, and operates sanitary sewers within its sewer service area through an agreement with Lucas County.
    - **City of Perrysburg**: Owns and operates the sanitary sewers in portions of the FPA in Wood County. Wastewater is transported to the WRRF via the Northwestern Water and Sewer District (the District) collection system.
    - **City of Waterville**: Owns and operates the sanitary sewers within its corporate limits, has reserved allocated capacity in the WRRF, and operates sanitary sewers within its sewer service area through an agreement with Lucas County.
    - **Village of Whitehouse:** Owns and operates the sanitary sewer collection system within its corporate limits and operates sanitary sewers within its sewer service area through an agreement with Lucas County And has reserved allocated capacity in the WRRF.
    - **Northwestern Water and Sewer District**: Owns and operates sanitary sewers in portions of the FPA in Wood County.

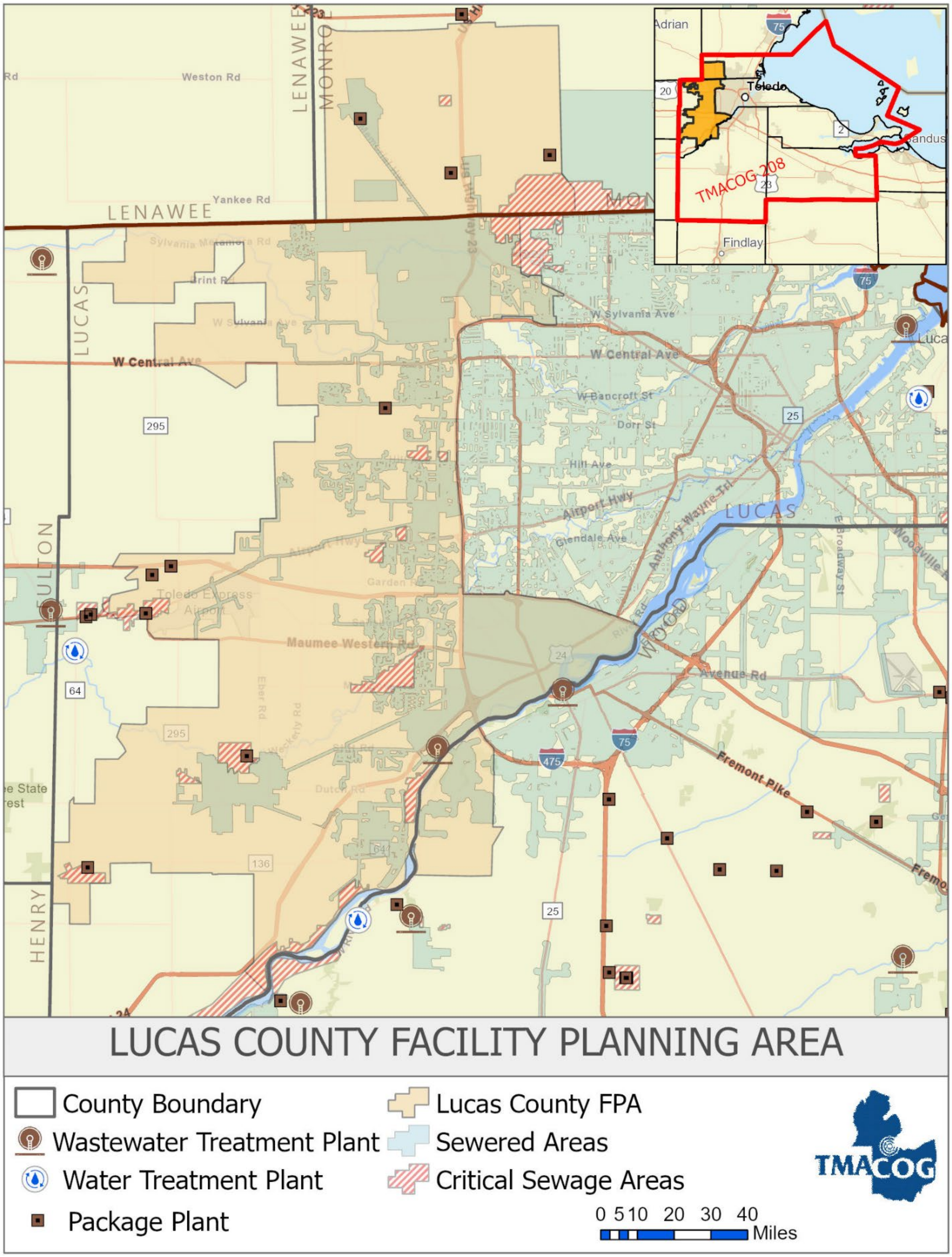


Figure 5 - 1: Lucas County Facility Planning Area

Table 5 - 1: Population of communities partially or wholly within the Lucas County FPA

Area	Population
Berkey, entire jurisdiction	275
Holland, entire jurisdiction	1,820
Maumee, entire jurisdiction	13,896
Perrysburg, entire jurisdiction*	25,041
Sylvania, entire jurisdiction	19,011
Toledo, entire jurisdiction*	270,871
Waterville, entire jurisdiction	6,003
Whitehouse, entire jurisdiction	4,990
Middleton Township, entire jurisdiction*	5,611
Monclova Township, entire jurisdiction*	14,827
Perrysburg Township, entire jurisdiction*	13,571
Providence Township, entire jurisdiction*	3,378
Richfield Township, entire jurisdiction*	1,575
Spencer Township, entire jurisdiction*	1,746
Springfield Township, entire jurisdiction	26,957
Swanton Township, entire jurisdiction*	2,822
Sylvania Township, entire jurisdiction	50,679
Waterville Township, entire jurisdiction*	7,036
Whiteford Township, entire jurisdiction*	4,590
Total	**474,699**

*only part of this jurisdiction is within the FPA boundary.
Source: US Census 2020 decennial census

Present Facilities

The WRRF has a capacity of 22.5 million gallons per day (mgd) average daily flow, and 54.8 mgd peak flow, upgraded in 2019. Ohio EPA data shows an average flow of 15.576 mgd, and a peak flow of 51.237 mgd during the period of 2016-2020. The treatment process uses the activated sludge process with anaerobic sludge digestion, centrifuge/belt filter press dewatering, and ultraviolet disinfection. Class B biosolids are applied to land, however, the WRRF is currently undergoing an improvement project that, in addition to becoming a regional organics/food waste recovery facility, will generate Class A EQ biosolids and become energy neutral.

The major system improvements since the mid-1970s have been expansions to the WRRF, many sewer extensions, closing of two municipal wastewater plants, construction of an interceptor to serve the Toledo Express Airport area, and construction of the McCord Road interceptor. The Lucas County FPA now includes the individual service areas that use the WRRF.

The Lucas County system provides pollution control to Tenmile Creek, Ottawa River, Swan Creek, the Maumee River, and several ditches. The extension into unsewered areas, the elimination of many package plants, and the closing of the Sylvania and Whitehouse wastewater plants brought about a pronounced cleanup of Tenmile Creek, Swan Creek and their tributaries. This was reflected by a great reduction in fecal coliform concentrations and oxygen demanding substances. Package plants located in the FPA are listed in Table 5-2.

Table 5 - 2: Package Plants in the Lucas County Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Arrowhead Trailer Park (west plant)[A]	LU-61B	Private	1986	2PY00067	30,000
Arrowhead Trailer Park (east plant)[A]	LU-61A	Private	1979	2PY00067	18,000
Bedford Meadows[A]	MO-02	Private*	1970, 1976	MI026611	30,000
Charlie's Restaurant[A]	LU-115	Private*	1988	No Disch.	7,000
Crossroads Community Church[A]	MO-09	Private*	2005	MI0057625	1,000
Hidden Lake[A]	LU-46	Private*	1966, 1975		7,200
Sisters of Notre Dame, Lial Convent[A]	LU-97	Private	1975 (additions)	2PT00056	17,500
Whispering Winds Mobile Home Community[A]	LU-33	Private	1970, 2010	2PY00064	12,500
Whiteford Valley Golf Course[A]	MO-08	Private*		MIG580030	4,657

[A]Status is active
*Facility type is assumed

Note: Data are based on current available data as of April 2019

Issues

The overall sewer system is subject to I/I problems. These rarely lead to bypassing but can interfere with efficient plant operation and raise treatment costs. In 2022, the Lucas County Sanitary Engineer's office began a multi-year, multi-phase SSES (Sanitary Sewer Evaluation Study) initially targeting those areas of suspected high inflow and infiltration.

The Lucas County FPA includes areas that are under pressure for development, and therefore sanitary sewer extensions. Most of the areas that were once pollution problems because of package plants or concentrations of septic systems have been tapped in. The continuing need will be to provide sewage service to accommodate planned development and eliminate failed septic systems. Both Swan Creek and Ottawa River have a long history of high bacterial levels. Both streams often exceed water quality standards at the City of Toledo's furthest upstream monitoring sites (Swan Creek at Eastgate, and Ottawa River at Sylvania Avenue near Wildwood Metropark). Failed septic systems are believed to be major contributors to these bacterial levels.

Berkey

The Village of Berkey has no sewage system. All sanitary waste is treated using "onlot" septic systems. Berkey was recognized as a *Critical Sewage Area* in TMACOG's 1983 *Home Sewage Disposal Priorities* study. In recent years, most of the failed septic systems have been repaired or replaced, so the Village is no longer a critical area. Long-term, however, Berkey is likely to need a sewage system.

The problem area was the central part of town, around the corner of Berkey-Southern and Sylvania-Metamora Roads. This area has the greatest concentration of older homes on small lots. A 1995 study by Feller and Finch recommended a gravity sewer system for Berkey connecting to the Lucas County system. The estimated cost was $1.7 million for a system to serve 96 users, or $1.1 million to serve 55 users. That system proved too costly for the community, and failed onsite systems were upgraded instead.

Holland

Sanitary sewers were installed in Holland and tapped into the Lucas County system in 1990.

Maumee

Maumee was connected to the Toledo sewer system until 1973 when the WRRF (formerly known as the Maumee River Treatment Plant) began operation. Maumee separated its sewers and eliminated its combined sewer overflows (CSOs) in a four-phase program completed in 1997. By 2001, the entire city was sewered with two small exceptions. One is Old Trail Road, where about a dozen houses are not on the sewer system which is proposed as a function of grant applications the city submitted in September of 2021. The second is Valley Drive, which has about half a dozen unsewered houses. This area does not have local sanitary sewers: of the six to eight homes on septic systems about three remain; the rest have been demolished. However, The City just recently completed a design for an additional small sanitary lift station in an effort to serve the above reference unserved homes.

The City of Maumee self-reported an SSO problem that appears to have been an ongoing problem since the city closed out it's CSO program in 1997. Initial projects and estimates for eliminating Sanitary Sewer Overflows and discharges (SSO) are as follows:

- 300,000 linear feet of sanitary sewer lining ($12,000,000)
- 200,000 linear feet of sanitary service lead relining or replacement ($6,000,000)
- Rehabilitation and lining of approximately 300 Sanitary Manholes ($2,400,000)
- Rehabilitation and/replacement and construction of approximately 80 storm sewer manhole structures ($700,000)
- Construction of approximately 15,000 linear feet of Storm sewer and related appurtenances (6,500,000)
- Removal of at least 9 sanitary sewer regulator chambers (all), (2,200,000)
- Replacement and new construction of approximately 20,000 linear feet of sanitary sewer main (12,000,000)
- Rehabilitation and/or replacement of 20 storm sewer outfall pipe and headwalls, including river slope stabilization (4,000,000)
- 10 additional years of flow monitoring consultation and data collection (4,000,000)
- 2,500 storm and sanitary sewer and footer/downspout separations (residential structures) (20,000,000)
- Rehabilitation, construction, and wet-well enhancement of City's Sanitary lift and pump stations. (14,000,000)
- The approximate cost for these projects is 83.8 million over the span of 10-15 years. Table 5-5 will be updated with more specific project timelines as they are developed.

Neapolis

Neapolis is an unincorporated, unsewered village in Providence Township, near the western edge of Lucas County, and is recognized as a Critical Sewage Area. The 2020 census records the population estimate of the Village at 497. Presently the area is served by individual septic systems, and one package plant at the Whispering Winds Mobile Home Community, in the northeast portion of the town. It is a 12,500 gpd extended aeration plant built in 1970, with sand filters and a chlorinator updated in 2011 per Ohio EPA. There are 58 mobile homes in the park. In 2005, the Lucas County Court of Common Pleas ordered the mobile home park owners to bring the wastewater plant into compliance with Ohio EPA standards. The mobile home park has since changed owners.

A Facilities Plan has been prepared for Neapolis, which documented water quality violations due to fecal coliform in local streams (Blue Creek and Aumend Ditch). The Toledo-Lucas County Health Department (TLCHD) notes in addition that septic system leach fields fail to function properly because of the seasonally high-water table. High groundwater, which occurs in the spring and fall, is a continuous threat to drinking water supplies, which are from private wells. Neapolis is not under order from Ohio EPA to install sewers.

The TLCHD has agreed to the installation of public water before sewers. Eliminating wells will allow more space on lot for septic systems and will help alleviate system failures in the short term.

In 1988, TMACOG did a study of lower-cost alternative technology systems for Neapolis and proposed a system costing an estimated $530,000. No financial aid was available for the project, and it was not affordable. Neapolis continues to need a sewer system; financial assistance is needed to make it affordable to residents.

An updated General Plan is needed to identify the best service options for the area and estimate current costs. The General Plan should include a financing plan. The town of Neapolis proper, the trailer park, and the Woodbrier subdivision stand a reasonable chance of qualifying for financial assistance, but an income survey will probably be needed. Lucas County plans on serving Neapolis by tapping it into the County system to the WRRF.

Perrysburg

The City of Perrysburg has a small sewered area that falls within the Lucas County FPA portion in Wood County. This area is in the far western part of Perrysburg Township where the City owns and operates sanitary sewers. The City's collection system is tributary to the Northwestern Water and Sewer District's (District) system, which then conveys the sewage to the WRRF for treatment.

Sylvania

Sewers in Sylvania were originally served partly by the City's 0.3 mgd wastewater plant that began operation in 1957 and discharged into the Ottawa River. Additional portions of the city, up to 2.0 mgd of flow, connected to the Toledo system. Excess flows went into the Ottawa River. In 1977, the two systems were consolidated, and the entire City was connected to the WRRF. In 2007, there is one area in the Sylvania service area identified as needing sewers:

- Alexis/Whiteford area; the TLCHD collected samples in this area and found elevated fecal coliform levels.

Waterville

Waterville had its own 0.12 mgd treatment plant, which was abandoned around 1977 when the city tapped into the Lucas County system. The storm and sanitary sewers were separated in 1975.

Whitehouse

Whitehouse had its own 0.29 mgd wastewater plant, which discharged to Disher Ditch. It was abandoned in 1989 when the Village tapped into the Lucas County system. Whitehouse has also eliminated all connections between the sanitary and storm sewers and the systems are entirely separate.

There are some unsewered areas remaining within the Village itself. Whitehouse Facilities Plan (Poggemeyer, 1981) makes note of these: "The Village should provide unsewered Village areas with service, as the density of development demands such facilities." Connecting unsewered houses within the Village to the public sewer will further reduce pollution to local streams.

Several areas near Whitehouse, but outside of the Village corporate limits, need sanitary sewers. It is the recommendation of this Plan that these areas be connected into the village system:

- The Springbrook Farms/Davis Road area. It includes 92 houses, plus a package plant at the Lial School, and is located between the north corporate limits and Obee Road. The first phase of this project has been completed, from Providence Street west to just beyond Industrial Boulevard. The next phase of this project is listed on the Village of Whitehouse’s capital improvement plan.
- SR 64 (Centerville Street / Waterville-Swanton Road) northwest of the corporate limits: about 10-15 houses. This project is listed on the Village of Whitehouse’s capital improvement plan.

The Village of Whitehouse has identified several future sanitary sewer extension projects within its service district of the FPA. They are listed in the “Future Needs” table, below.

Northwestern Water and Sewer District (the District)

The WRRF provides treatment for the District in Wood County for an area west of Hull Prairie Road in Perrysburg and Middleton Townships. This service is pursuant to an agreement reached between Lucas and Wood Counties in 1975. Seven subdivisions in the FPA are served by Lucas County: Willowbend (at SR 65 and Roachton Road), Saddlebrook (south side of Roachton at Hull Prairie), Riverbend (on the east side of SR 65), The Village at River Bend Lakes (south side of Roachton between SR 65 and Saddlebrook), Hull Prairie Meadows (south of Roachton North of Five Points and West of Hull Prairie), Carrington Woods (on the east side of SR 65, between Roachton Road and I-475, and The Sanctuary (the former Divine Word Seminary)). The District conveys sewage to the WRRF for the City of Perrysburg for a small portion of the City that falls within the Lucas County FPA (see Perrysburg section).

A section of Middleton Township in Wood County along Five Point Road from the CSX railroad tracks west to the Maumee River is also known as Shelton Gardens. In 2006, Ohio EPA ordered sanitary sewers for this area. Most of the area was in the Lucas County FPA; however, a portion of the ordered area between Hull Prairie Road and the railroad tracks lies within the Perrysburg FPA. The portion of Shelton Gardens then in the Perrysburg FPA was moved to the Lucas County FPA subject to the following provisions stated in TMACOG Resolution 2007-26:

> *THAT the area along Five Point Road between Hull Prairie and the CSX tracks shall remain in the Lucas County FPA until a sewer connected to the Perrysburg system becomes*

available; and

THAT when a Perrysburg sewer becomes available, the area may revert to the Perrysburg FPA; sanitary sewer services may be disconnected from the Lucas County system and connected to the Perrysburg system at the City of Perrysburg's discretion; and

THAT the City of Perrysburg and Northwestern Water and Sewer District agree that notwithstanding availability of a Perrysburg sewer, the Hull Prairie-CSX triangle shall remain in the Lucas County FPA and not be moved back to the Perrysburg FPA before January 1, 2028.

In 2014, the portion of the ordered area from Shelton Gardens west to River Road was connected to the Riverbend sanitary sewer system

The Willowbend Pump Station that serves the entire District service area was replaced in 2023 and a third force main river crossing was placed in service for future system growth in Wood County.

Ottawa Lake

Ottawa Lake is an unincorporated community in Whiteford Township, Monroe County Michigan. Sanitary sewers were constructed to serve the area in 2014, connecting to the Lucas County system via the City of Sylvania.

Karst bedrock formations and sinkholes are common in the area. Groundwater is vulnerable to contamination from failed on-site sewage systems, and several wells in the area showed signs of bacterial contamination during a 2006 - 2008 investigation. In April 2010, the Michigan Department of Natural Resources (Michigan DNR) ordered construction of sewers. The Whiteford Township 671-acre municipal Sanitary Sewer District (#2) serves approximately 59 houses, 31 businesses, and 23 vacant parcels. The collection system is a gravity sewer routed to a pump station to the state border, and delivered by metered gravity flow to the Sylvania, Ohio wastewater system.

The facilities include 5,400 feet of gravity sewer, a pump station, 18,400 feet of force main, a meter vault, and appurtenances. The Whiteford Township portion of the FPA includes several other critical sewage areas and package sewage treatment plants. The Township completed a sewer extension project in 2015-2016 that eliminated the Critical Sewage Area of Hicker and Acre Roads. The remaining areas should be priorities for future service extension.

Capital costs for the Ottawa Lake project were paid with a loan from U.S. Department of Agriculture Rural Development (USDA-RD), repaid by special assessment on properties in the sewer district. Future repairs and modifications will be funded through a small portion of revenue generated by monthly sewer billing. Treatment and handling costs billed by Sylvania will also be paid from the monthly sewer bill. Future capitalization to expand the facilities would be funded by special assessment of properties added to the system at that time.

208 Policies for New Subdivisions in Lucas County FPA

It is the policy of this Plan that all new major subdivisions in Lucas County shall be improved with public sanitary sewers that are designed and constructed in accordance with the specifications of the Lucas County Sanitary Engineer or other appropriate Designated Management Agency (DMA), consistent with regulations of the TLCHD. Septic tanks or individual household sewage treatment systems should be discouraged for new subdivisions within the FPA boundary. New subdivisions are encouraged to connect to public sewers and be served by the WRRF.

All new residential subdivisions in Wood County that are required to be platted under subdivision regulations: for platted subdivisions of more than five (5) lots, septic tanks or individual household sewage treatment systems shall not be permitted within the FPA boundary. New platted subdivisions shall connect to public sewers and be served by the WRRF.

Future Needs

- The WRRF was expanded to an average daily flow capacity of 22.5 mgd in 2005 at a cost of $17.1 million. The ultimate design capacity to which the WRRF could be enlarged at the current site is 30.0 mgd average daily flow, or 62.66 mgd maximum. As the system ages, it is anticipated that the focus will change from expansion to repair and replacement.
- Sewer extensions to eliminate remaining problem areas and provide service to new development. New package plants and septic systems should not be permitted in areas that may be served by public sewers.
- Future collection system improvements for the WRRF and the Lucas County service districts within the Lucas County FPA are provided in Tables 5-3 to 5-7.

Table 5 - 3: Lucas County FPA Capital Improvement Schedule – Lucas County

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2024	2025	2026	2027	2028	2029	Future
Wolf Creek Siphon Rehabilitation COMPLETE	Lucas County	**$1,300,000**							
S500 Rehab – MH2 to MH4 COMPLETE	Lucas County	**$3,300,000**							
S-897 Shoreland Avenue COMPLETE	Lucas County	**$750,000**							
Anaerobic Digester Improvements	Lucas County	**$20,000,000**							
S500 Rehab – MH4 to MH6 COMPLETE and Swan Creek Siphon	Lucas County	**$ 5,200,000**							
Angola Rd. Sewer COMPLETE	Lucas County	**$1,900,000**							
Breckenridge and Spencer Sharples Pump Station Improvements COMPLETE	Lucas County	**$510,000**							

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2024	**2025**	**2026**	**2027**	**2028**	**2029**	**Future**
WRRF Site Improvements COMPLETE	Lucas County	**$2,500,000**							
Forest Lakes and Deerpointe Pump Station Improvements	Lucas County	**$1,000,000**		**1,000,000**					
WRRF East Grit Chamber COMPLETE	Lucas County	**$700,000**	**700,000**						
WRRF Roof Repairs	Lucas County	**$6,000,000**		**1,000,000**	**1,000,000**	**4,000,000**			
WRRF UV Disinfection Improvements	Lucas County	**$4,500,000**		**1,000,000**	**2,000,000**	**1,500,000**			
S-124 Ottawa Hills Sewer Lining	Lucas County	**$1,000,000**	**1,000,00 0**						
WRRF West Screen Rehabilitation	Lucas County	**$2,000,000**		**2,000,000**	**1,000,000**				
Monclova Rd. Sanitary Sewer Extention (Downtown Monclova)	Lucas County	**$2,000,000**	**2,000,00 0**						
SSES Evaluation	Lucas County	**$450,000**		**150,000**	**150,000**	**150,000**			
Rec Center Lining COMPLETE	Lucas County	**$150,000**							
Total:		**$53,260,000**							

Table 5 - 4: Lucas County FPA Capital Improvement Schedule – Sylvania Service District

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2024	**2025**	**2026**	**2027**	**2028**	**2029**	**Future**
Allen Street Sanitary Sewer Replacement	Sylvania	**Pending**							
Angleview – Trailway to Elden	Sylvania	**Pending**							
Equipment		**$250,000**		250,000					
Fairview-Parkwood	Sylvania	**Pending**							
Highland View Park Sanitary Sewer	Sylvania	**Pending**							

Replacement									
Large Diameter Sewer Rehab	Sylvania	**$567,888**	567,888						
Main Street SS Lining – Convent to Ten Mile Creek	Sylvania	**$710,958**	710,958						
Maplewood Sanitary Sewer Rehab	Sylvania	**$512,900**	12,900		500,000				
Monroe Street Pumping Station Retrofit	Sylvania	$1,000,000				1,000,000			
San Benito Sanitary Sewer Replacement	Sylvania	**$160,000**				16,000	144,000		
Sylvania Pumping Station Retrofit	Sylvania	**$1,000,000**			1,000,000				
		$4,201,746							

Table 5 - 5: Lucas County FPA Capital Improvement Schedule - Maumee Service District

Project	**DMA**	**Total Cost**	**Annual Capital Improvement Needs**						
			2024	**2025**	**2026**	**2027**	**2028**	**2029**	**Future**
Sanitary Sewer Lining		**$12,000,000**	$1.5M	$1.5M	$1.5M	$1.5M			$4,000,000
Sanitary Service Lead Relining or Replacements		**$6,000,000**	-	$500,000	$500,000	$500,000			$4,500.000
Rehabilitation and Relining of Sanitary Manholes		**$2,400,000**	$300,000	$300,000	$300,000	$350,000			$1,000,000
Rehabilitation and Relining of Storm Sewer Manholes		**$700,000**	-	$100,000	$100,000	$100,000			$400,000
Construction of Storm Sewer and Related Appurtenances		**$6,500,000**	-	$100,000	$100,000	$150,000			$6,100,000
Removal of Sanitary Sewer Regulator Chambers		**$2,200,000**	-	-	$100,000	$250,000			$1,750,000
Replacement and Construction of Sanitary Sewer Main		**$12,000,000**	$100,000	$100,000	$100,000	$100,000			$11,567,050
Rehabilitation and/or Replacement of Storm Sewer Outfall Pipes and Headwalls		**$4,000,000**	$50,000	$50,000	$100,000	$100,000			$3,650,000

Flow Monitoring Consultation and Data Collection		**$4,000,000**	200,000	200,000	225,000	225,000			$2,900,000
Storm and Sanitary Sewer Footer/Downspout Separations		**$20,000,000**	-	200,000	200,000	200,000			$19,400,000
Rehabilitation, Construction, and Wet-well Enhancement		**$14,000,000**	60,000	50,000	50,000	50,000			13,750,000
***Estimated Costs.**		**$83,800,000**	**$710,000**	**$1,600,000**	**$1,775,000**	**$2,025,000**			**$64,521,550**

Table 5 - 6: Lucas County FPA Capital Improvement Schedule – Waterville Service District

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2024	**2025**	**2026**	**2027**	**2028**	**2029**	**Future**
Sewer Line Improvements	Waterville	**$175,000**	25,000	25,000					
Total:		**$175,000**							

Table 5 - 7: Lucas County FPA Capital Improvement Schedule – Whitehouse Service District

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2024	**2025**	**2026**	**2027**	**2028**	**2029**	**Future**
S.R. 295 - South to U.S. 24	Whitehouse	**$7,500,000**							7,500,000
Industrial Park-New Development	Whitehouse	**$140,000**			35000	35000	35000	35000	
Noward Rd. Ext North to Dutch	Whitehouse	**$1,325,000**							1,325,000
S.R. 295 Sanitary Sewer Extension to S.R. 64	Whitehouse	**1,950,000**							1,950,000
Collection System Rehabilitation	Whitehouse	**$3,200,000**			1,600,000		1,600,000		
Lift Station – Wet Well Rehabilitation	Whitehouse	**$225,000**		75,000		75,000		75,000	
		$14,340,000							

Oregon Facility Planning Area

The Oregon Facility Planning Area (FPA) is a designated area within Oregon and Southeastern part of Wood County (Figure 5-2), where wastewater management, including sewage treatment, is planned and coordinated. It defines the specific areas that are expected to be serviced by wastewater treatment facilities. This area is part of the broader effort to ensure that wastewater infrastructure adequately serves the local population, addresses environmental impacts, and complies with regulatory standards. The Oregon FPA outlines the boundaries within which wastewater treatment facilities operate. These wastewater facilities are managed by designated management agencies.

Designated Management Agency Responsibilities:

- **City of Oregon**: Owns and operates the Oregon Water Resource Recovery Facility (WRRF). Owns and operates the sanitary sewers in the unincorporated areas of Oregon and various other communities by agreement. The WRRF provides treatment services to all, or part of the following communities as specified in the Oregon Facility Planning Area wastewater treatment facilities, and collection system within the corporate limits.
    - **City of Northwood**: Northwestern Water and Sewer District (the District) owns some of the sanitary sewers within the corporate limits in the Oregon FPA, and the District owns others in the unincorporated areas. All sanitary sewers operated by the District connect to Oregon's system for treatment.
    - **Village of Harbor View**: Owns the sanitary sewer system within the corporate limits, operated by the Lucas County Sanitary Engineer through an agreement with the Village. Connects to Oregon's system for treatment.
    - **Village of Millbury**: The District owns and operates sanitary sewers within the corporate limits and connects to Oregon's system for treatment.
    - **Lucas County:** Owns and operates collection system in Lucas County unincorporated areas, connecting to Oregon's system for treatment.
    - **Northwestern Water and Sewer District:** Owns and operates sanitary sewers in Wood County unincorporated areas and connects to Oregon's system for treatment.

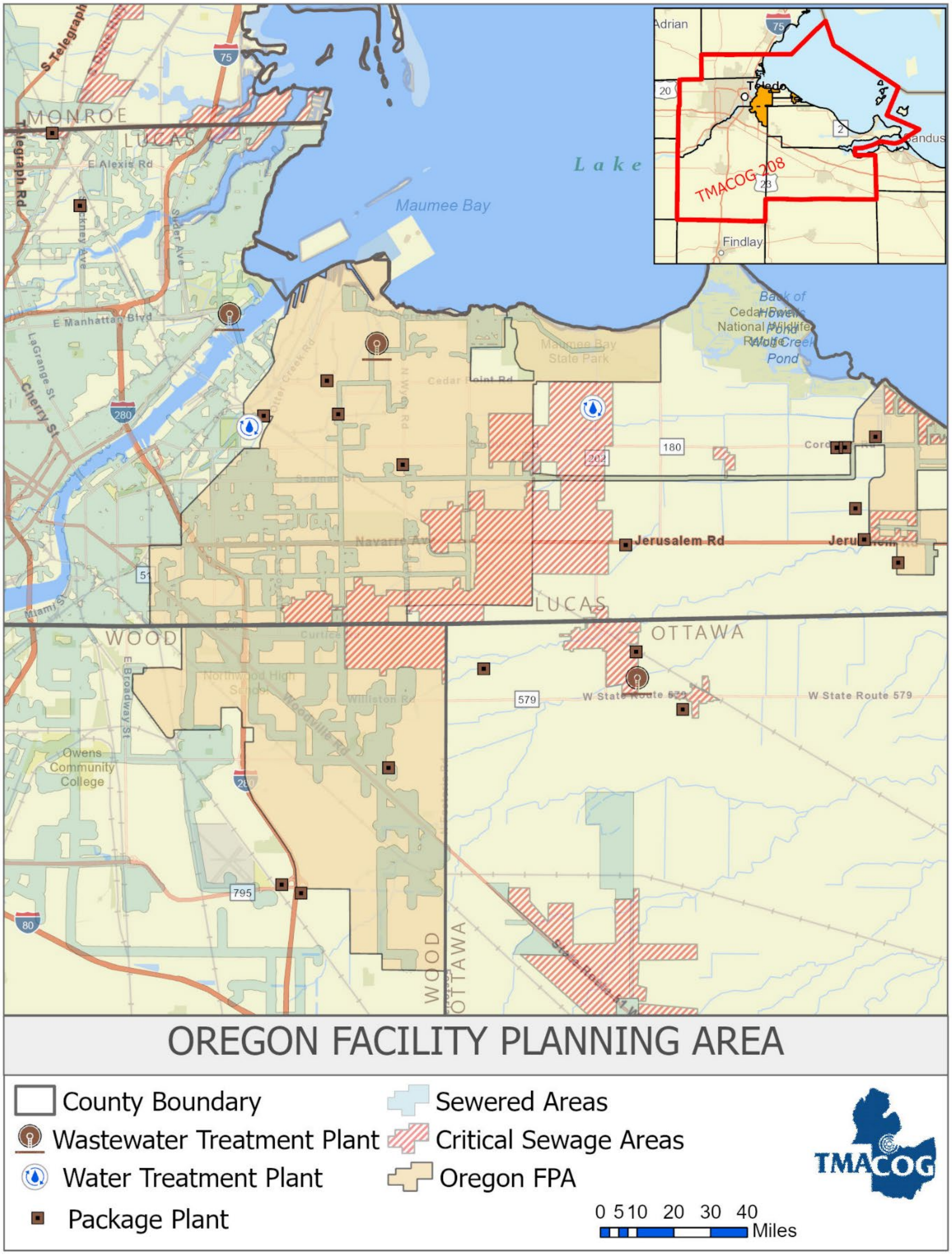


Figure 5 - 2: Oregon Facility Planning Area

Table 5 - 8: Population of communities partially or wholly within the Oregon FPA

Area	Population
Oregon, entire jurisdiction	19,950
Harbor View, entire jurisdiction	89
Millbury, entire jurisdiction	1,193
Northwood, entire jurisdiction*	5,160
Jerusalem Township, entire jurisdiction*	2,895
Lake Township, entire jurisdiction*	11,160
Total	**40,447**

*Only part of this jurisdiction is within the FPA boundary.
Source: U.S. Census 2020 decennial census

Present Facilities

The Oregon wastewater treatment plant was constructed in 1977 and last upgraded in 2022. The plant is an 8.0 million gallon per day (mgd) activated sludge facility, designed to serve the City of Oregon, Jerusalem Township, the District #200, the Village of Harbor View, and Maumee Bay State Park. Its peak hydraulic capacity is 36.0 mgd. During the period 2017-2022, average daily flow varied from 5.4 (2017) to and 7.78 (2021) mgd(Fact Sheet for NPDES Permit Renewal, Oregon WWTP, 2023) [1] . Maximum flow varied between 18.23 and 35.96 mgd. Plant facilities include bar screen, influent pumping, grit removal, flow equalization, activated sludge, ferrous chloride addition for phosphorus removal, secondary aeration, final settling, and UV disinfection. The sewage sludge treatment process includes aerobic digestion and dewatering by centrifuge. Historically, sludge was applied to agricultural land at agronomic rates, however, more recently the sludge has been dewatered at the WWTP and disposed in a municipal landfill.

Since the completion of WWTP on Dupont Road, its service area has been expanded through sewer extensions. The South Shore Park subdivision originally had its own package plant. It was abandoned in 1991, and the area is now connected to the main Oregon system. Harbor View and North Oregon were tapped in 1996 at a cost of $3.2 million. Oregon became a city when the entire Township incorporated. Many areas remain sparsely developed or rural, and unsewered. Package plants located in the FPA are listed in Table 5-9. It is the policy of this Plan that package plants shall be required to tap into public sanitary sewers when they become available.

Table 5 - 9: Package Plants in the Oregon Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
5104 Walbridge[A]	WO-17	Private*			12,000
Meinke Marina[A]	LU-122	Private		2PR00165	10,000
BP Husky Oil Refinery[A]	LU-30	Private	1958, 1974	2IG00007	21,500
Buckeye Pipeline[A]	LU-19	Private*	1962	2GS00022	1,500
Our Lady of Mt. Carmel[A]	LU-10	Private*	1967 (expansion)		4,000
Wynn Road Homes[A]	LU-26	Private*	1981	No discharge	2,000
Ivy Steel and Wire[A]	LU-27	Private*	1973		3,500

[A]Status is active

1 City of Oregon. (2023). NPDES Permit to discharge to waters of the State of Ohio for City of Oregon WasteWater Treatment Plant (2PD00035*PD). https://dam.assets.ohio.gov/image/upload/epa.ohio.gov/Portals/35/permits/doc/2PD00035.pdf

*Facility type is assumed
Note: Data are based on current available data as of April 2019

Issues

City of Oregon

A large part of the Oregon FPA is unsewered. Eliminating package plants and failed septic systems is a major challenge for Oregon and Jerusalem Township. The Lake Erie beaches at Maumee Bay State Park often have posted warnings of elevated bacteria levels, which have been attributed to failed septic systems. Postings are very weather-dependent, but average more than 15 days out of the 100-day recreational season. Beach postings due to harmful algal blooms have also become more prevalent in recent years with five out of the past seven years having postings totaling more than 20 days.

Health Department testing indicates that septic system failure is very common in the area. Some areas are densely populated enough to require public sewers. In 1998-1999, the Toledo- Lucas County Health Department (TLCHD) conducted a stream and septic system testing program in Oregon and Jerusalem Township. In Oregon, 11 of 19 stream sites showed bacteria levels above water quality standards.

Trunk sewers were built along Stadium Road, Seaman Road from Lallendorf to Wolf Creek, and Stadium between Pickle and Corduroy Roads between 2001-2005. The Seaman and Stadium trunk sewer project is approximately seven miles long with a service area of 5,350 acres or 8.4 square miles; cost of the project was $7.6 million. These sewers eliminated hundreds of septic systems and three package sewage treatment plants.

- In 2004, the City also constructed the Pickle & Wynn local sewer project, which is three miles long, at a cost of $2.5 million. This project serves approximately 200 households in the Wolf Creek Watershed that previously had septic systems.
- In 2006-2007, Oregon constructed the Coy Road sanitary sewer project, which included 3,300 feet and cost $400,000. This project eliminated approximately 30 failing septic systems.

In recent years, the Oregon wastewater collection system has experienced sanitary sewer overflow (SSO) events due to overloading from extraneous stormwater. Oregon's National Pollutant Discharge Elimination System (NDPDES) permit includes the implementation of a Management, Operation, and Maintenance (MOM) program and the elimination of SSOs through a schedule of compliance with a System Evaluation and Capacity Assurance Plan (SECAP). The City of Oregon's capital improvement plan includes projects for elimination of I/I through a series of rehabilitation projects, as per the SECAP compliance schedule; this work is ongoing (see Table 4-11 below).

- In 2009, Oregon rehabilitated sanitary sewers and sanitary manholes in the Wheeling Street District of the collection system. This work included the lining of 9,401 linear feet of various size sanitary sewer and the rehabilitation of 51 sanitary sewer manholes. Sanitary sewers crossing underneath creeks were targeted for the lining project.
- In 2012-2013, the City of Oregon rehabilitated approximately 66 additional manholes in the collection system by a variety of methods including lining and chemical grouting. These manholes were noted as needing some sort of rehabilitation during Global Positioning System (GPS) manhole inspections completed 2007-2010.
- In 2012-2013, the City of Oregon completed the Sanitary Sewer Rehabilitation Project, Phase II. This included the replacement of sanitary sewers and manholes in the Cresceus Heights subdivisions,

between Navarre Avenue and Pickle Road. Sanitary sewers and residential home connections were replaced within the City right of way. This work also included the continued lining of the Wheeling Street Trunk Sewer from Navarre Avenue to north of Starr Avenue. Manholes within the sewer lining project were also lined. Statistics for this project are as follows: 6,417 linear feet of 8" sanitary sewer, 4,727 linear feet of 6" lateral service, 23 sanitary sewer manholes, nine sanitary sewer manholes lined, 454 linear feet of 30" sanitary sewer lined, 2,661 linear feet of 27" sanitary sewer lined, 180 linear feet of 12" sanitary sewer lined, 610 linear feet of 8" sanitary sewer lined.

- In March 2013, sanitary sewer flow meters were installed in sewers serving South Shore Park and Navarre Avenue to further define sources of I/I within these areas. Flow meters were removed in July 2013 and have given the City direction on where to concentrate I/I efforts in the North Oregon Sanitary Sewer District, as well as, the Wheeling Street Sanitary Sewer District.
- In 2015-2016, the Sanitary Sewer Rehabilitation Project Phase 3 was completed in the Eastmoreland and Euclid Park areas of the Wheeling Street Sanitary Sewer District. This work included the trenchless rehabilitation of sanitary sewer mainlines, manholes, and laterals within the public right-of-way. Statistics for this project are as follows: 535 linear feet of 30" sanitary sewer lined, 2,969 linear feet of 12" sanitary sewer lined, 355 linear feet of 10" sanitary sewer lined, 9002 linear feet of 8" sanitary sewer lined, 186 sanitary sewer cleanouts installed, 194 sanitary sewer laterals lined, 16 sanitary sewer point repairs completed, 14 sanitary sewer risers lined, and 875 vertical linear feet (56 manholes) of sanitary sewer manholes were lined. Total project cost was $1,776,066.53.
- In 2016-2017, the Sanitary Sewer Rehabilitation Project, Phase 4, Part A was completed in the Ketcham's Little Farms, East Hollywood, and Woodville Heights areas of the Wheeling Street Sanitary Sewer District. This work included the trenchless rehabilitation of sanitary sewer mainlines, manholes, and laterals within the public right-of-way. Statistics for this project are as follows: 893 linear feet of 12" sanitary sewer lined, 1,148 linear feet of 10" sanitary sewer lined, 5,049 linear feet of 8" sanitary sewer lined, 34 sanitary sewer cleanouts installed, 116 sanitary sewer laterals lined, 11 sanitary sewer point repairs completed, 298 vertical linear feet (21 manholes) of sanitary sewer manholes were lined. Total project cost upon completion was $1,041,197.78.
- In 2016, the City of Oregon extended a trunk sanitary sewer down Wynn Road, to the midblock of Cedar Point Road and Corduroy Roads. Statistics for this project are as follows: 2,613 linear feet of 24", 2,880 linear feet of 15", 63 linear feet of 10", 171 linear feet of 8", and 44 linear feet of 6" sanitary sewer was installed. Total Project Cost for this extension was $1,891,850.86.
- In 2017-2018, the City of Oregon completed Sanitary Sewer Rehabilitation Project Phase 4, Part B. The rehabilitation project included the trenchless rehabilitation of sanitary sewer mainlines, manholes, and laterals within the public right-of-way. The following lining was completed: 140 linear feet of 15" sanitary sewer, 2,570 linear feet of 12" sanitary sewer, 1,679 linear feet of 10" sanitary sewer, 7,040 linear feet of 8" sanitary sewer, 135 sanitary sewer laterals, 10 sanitary sewer point repairs, 717 vertical linear feet of sanitary sewer manholes (48 manholes). The project also included the installation of three new sanitary sewer manholes. Total Project Cost for this work was $1,245,220.50.

- In 2018-2019, the City of Oregon completed the Sanitary Sewer Rehabilitation Project Phase 4, Part C. The sewer rehabilitation project included the trenchless rehabilitation of sanitary sewer mainlines, manholes, and laterals within the public right-of-way. This work was completed in the Moundview Subdivision of the City. The project included the following work: lining of 177 linear feet of 12” sanitary sewer, 172 linear feet of 10” sanitary sewer, 8441 linear feet of 8” sanitary sewer, 225 sanitary sewer laterals, and 381 vertical linear feet of sanitary sewer manholes (31 Manholes). The project also included the construction of 15 new sanitary sewer manholes, and 15 sanitary sewer point repairs. Total Project Cost for this work was $2,241,729.50.
- In 2019, the City of Oregon constructed a petitioned sanitary sewer extension on Norden Road from Seaman Road south to Wolf Creek. This project included the construction of approximately 952 linear feet of sanitary sewer and four new sanitary sewer manholes. This project eliminated eight septic systems in the Wolf Creek watershed. Total Project Cost for this work was $153,011.00 (contract bid price).
- In 2020, the City of Oregon completed a petitioned sanitary sewer extension on Norden Road from Seaman Road north to Corduroy Road. This project included the construction of 1,710 linear feet of sanitary sewer and five new sanitary sewer manholes. This project eliminated 19 septic systems. Total project cost for this work was $320,041.11In 2021, the City of Oregon completed construction of the Sanitary Sewer Rehabilitation Project Phase 5, Part A. The sewer rehabilitation project included the trenchless rehabilitation of sanitary sewer mainlines, manholes, and laterals within the public right-of-way. This work is being completed in the South Shore Park Subdivision of the City, adjacent to Lake Erie. The project included the following work: lining of 9,823 linear feet of 8” sanitary sewer, 215 sanitary sewer laterals, and 592 vertical linear feet of sanitary sewer manholes (56 Manholes). Total Project Cost for this work was $1,526,885.87.
- In 2023, the city of Oregon completed construction of the Sanitary Sewer Rehabilitation, Trunk Sewer and Miscellaneous Lateral Improvements Project. This sewer rehabilitation project focused on cleaning and rehabilitation of trunk sewers within the City as well as laterals and manholes in various locations that were needing to be rehabilitated. Overall, the project included the following work: lining of 460 linear feet of 8” sanitary sewer, 1,215 linear feet of 10” sanitary sewer, 1,500 linear feet of 18”, and 461 linear feet of 24” sanitary sewer. The project also included lining of 33 sanitary sewer laterals and 341 vertical linear feet of sanitary sewer manholes (16 manholes). Total project cost for this work was $777,168.00.

As part of the NPDES permit required No Feasible Alternative (NFA) analysis, the Oregon WWTP is addressing wet weather wastewater bypasses at the plant. This will be accomplished through increasing the secondary treatment capacity from 24.0 mgd to 36.0 mgd, which represents the hydraulic capacity of the plant. Secondary treatment capacity will be increased through the addition of a new final settling tank, aeration tank improvements, disinfection improvements, and effluent pumping improvements.

- Phase 1 of the WWTP Secondary Treatment Improvements was completed in December 2014. Phase 1 included the replacement of two influent screens, two blowers, replacement of three raw sewage pump motor drives, full replacement of air piping and replacement of air diffusers in aeration tanks, a dissolved oxygen control system, site restoration, and associated Supervisory Control Data Acquisition (SCADA) upgrades. Total project cost was $6,536,032.
- Phase 2 of the WWTP Secondary Treatment Improvements has been completed. The Phase 2 project improvements consist of a new final clarifier with associated secondary sludge pumping

facilities, aeration tank improvements consisting primarily of replacement of stop plates and slide gates, disinfection improvements consisting of replacement of the chlorine feed and safety equipment, effluent pump replacement and improvements, site restoration, and associated SCADA upgrades. Total project cost was $7,572,882.27.

- During 2017-2018, the Oregon WWTP constructed the WWTP Sludge Dewatering improvements. These improvements allowed the WWTP to dewater sludge for disposal at a landfill facility. In general, the improvements included the following: installation of a new sludge grinder, new centrifuge feed pumps, replacement of existing sludge transfer pumps and associate piping, construction of a new sludge dewatering building with new centrifuges, polymer feed system, screw conveyors, dumpster / truck loading areas, and associated structural, electrical, HVAC, plumbing, process piping and other appurtenances. The total cost for this project was $3,540,459.56.

- During 2017-2018, the District constructed the SS200 Area Equalization Basin to capture excess sewer flow during wet weather. The City of Oregon treats flows from this area which includes Millbury and parts of Northwood and Lake Township. In wet weather, the aged sewers in this system are influenced by infiltration and inflow. The Ohio EPA required that the City of Oregon make improvements to their treatment plant to better handle storm flows. As part of this requirement, the District was required to construct a storage basin to detain the high flows until the wet weather influence subsides. At that time, the basin discharged at a controlled rate to the Oregon system. The project cost was approximately $6 million.

  In early 2019, the City of Oregon began preliminary design for the Oregon WWTP to change disinfection methods from chlorine disinfection to UV disinfection. This preliminary design was expected to be completed by the end of 2019.

- In May of 2022 the City of Oregon began construction of the Oregon WWTP Safety, Disinfection, and Grit Removal Improvements Project. Construction of this project has reached substantial completion. This project included the below improvements at a total cost of $5,711,195 (projected, will be updated upon closeout):

  - Demolition of existing aerated grit tank, construction of electrical room addition and new grit tank and associated grit removal equipment in Plant 2
  - Replacement of grit removal equipment in Plant 3
  - Cleaning of six aeration tanks and maintenance of existing diffusers
  - Installation of launder covers on five final settling tanks
  - Replacement of chlorine disinfection equipment with new UV disinfection system
  - Modifications to existing Chlorine Contact Tanks to include new channel for UV disinfection system
  - Roof replacements on four buildings
  - Miscellaneous Concrete and Railings Repairs

Reno Beach / Bono

Reno Beach, Bono, and the Howard Farms subdivisions are an unincorporated area with approximately 500 houses in eastern Jerusalem Township. The area was under orders from Ohio EPA to install sewers. They were completed in 2005 for 400 of the total residences at a cost of about $11 million. The remaining residences are unsewered, and these areas are recognized as Critical Sewage Areas.

208 Policies for New Subdivisions in Oregon FPA

It is the policy of this Plan that all new major subdivisions in Lucas County shall be improved with public sanitary sewers that are designed and constructed in accordance with the specifications of the Lucas County Sanitary Engineer or other appropriate Designated Management Agency, consistent with regulations of the TLCHD. Septic tanks or individual household sewage treatment systems should be discouraged for new subdivisions within the FPA boundary. New subdivisions are encouraged to connect to public sewers and be served by the Oregon wastewater treatment plant.

All new residential subdivisions in Wood County that are required to be platted under subdivision regulations: for platted subdivisions of more than five (5) lots, septic tanks or individual household sewage treatment systems shall not be permitted within the FPA boundary. New platted subdivisions shall connect to public sewers and be served by the Oregon wastewater treatment plant.

Future Needs

- Sewer extensions to eliminate remaining problem areas and provide service to new development. New package plants and septic systems should not be permitted in areas that may be served by public sewers.
- Work with Lucas and Ottawa Counties, and Jerusalem and Allen Townships in planning sewerage facilities for the Curtice and Williston areas. Lucas County Sanitary Engineer (LCSE) is working with the Ottawa County Sanitary Engineer (OCSE) for a Master Plan of the Curtice-Williston Area. Ottawa County and Lucas County have entered into a contract with Kleinfelder. The scope of this contract includes updating the master plan and exploring more cost-effective alternatives for public sewers and/or on-lot system repairs/replacements ("hybrid solutions"). Also included will be a plan to maximize the grant amount to design for a shovel ready project (or phased approach) and prepare us to seek additional grant funds for construction. A kickoff meeting was held in January 2018. As part of this plan, 270 Lucas County addresses are to be served and a greater number of addresses in Ottawa County. The Genoa WWTP does not have the capacity to provide treatment, therefore other options are being explored including treatment by another facility, construction of a new package plant system, or treatment by the Oregon WWTP. A meeting was held on July 14, 2020 with the Ohio EPA, Ottawa County and Lucas County to have an in depth discussion of the plan moving forward for the Curtice-Williston Area. The Ohio EPA issued and entered the Director's Final Findings and Orders on May 25, 2021 to the Ottawa County Commissioners, the Ottawa County Board of Health, the Lucas County Commissioners and the Lucas County Regional Board of Health for the unincorporated areas of Curtice and Williston. The Ohio EPA conducted further water quality surveys of Cedar and

Crane Creeks in 2021 to document potential upstream sources of pollutants and how they may factor into water quality observed in the area.

- Oregon's 2012 – 2017 NPDES Permit stated the "Oregon WWTP receives excessive infiltration and inflow (I/I) which results in one or more of the following: collection system overflows; surcharging of sewers; hydraulic overloading of lift stations; sewage flows at the treatment plant that cause poor treatment plant performance and secondary bypasses." The permits require the following responses:
    - By 2019, completion of sewer rehabilitation for the west Brown Road area, OR 77, OR 79, and OR 85 (Sanitary Sewer Rehabilitation Project Phase 4, Parts A, B, and C). (COMPLETE)
    - Continued implementation of the System Evaluation and Capacity Assurance Plan (SECAP) and Management, Operation, and Maintenance (MOM) Program.
    - The City of Oregon has identified several high I/I areas that will be targeted for sewer rehabilitation. These areas include the South Shore Park subdivision along Bay Shore Road, near Lake Erie. Sanitary Sewer Rehabilitation Project, Phase 5 will target these areas with future sanitary sewer rehabilitation projects.
    - The City of Oregon has identified several high I/I areas that will be targeted for sewer rehabilitation. These areas include the New Eastmoreland subdivision, east of Wheeling Street. These areas will be targeted with the Sanitary Sewer Rehabilitation Project, Phase 3 projects over the next five years.

Future capital improvements for the Oregon FPA are given in Table 5-10.

Table 5 - 10: Oregon FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2024	2025	2026	2027	2028	2029	Future
Sewer Rehabilitation Project Phase 5, Part A-C (South Shore Park)	Oregon	**$3,000,000**							3,000,000
Sewer Rehabilitation Project Phase 3, Part A-C (East of Wheeling Street)	Oregon	**$3,000,000**		1,500,000		1,500,000			
Sanitary Sewer Rehabilitation Project – Trunk Sewer and Miscellaneous Lateral Improvements	Oregon	**$800,000**							
WWTP UV Disinfection and Grit	Oregon	**$8,200,000**	6,000,000						

Improvements									
Navarre Avenue Sewer Extension (Pending)	Oregon	**$2,100,000**							$2,100,000
Wynn, Curtice & Bradner Rd	The District	**$4,000,000**							$4,000,000
SS200 Area Lateral Rehab Phase II-III	The District	**$1,000,000**				$500,000	$500,000		
S-898 Allegan & Rubens Sanitary Sewer	Lucas County	**$125,000**	125,000						
		$18,225,000							

Swanton Facility Planning Area

The Swanton Facility Planning Area (FPA) is a designated area in Swanton, Ohio, where wastewater treatment and management are planned and coordinated. This FPA outlines the areas expected to be serviced by specific wastewater treatment facilities within Swanton (Figure 5-3). The purpose of the FPA is to ensure that wastewater infrastructure effectively meets the needs of the local population while adhering to environmental regulations and sustainability goals. In some cases, portions of the FPA may be serviced by other facilities or may remain unsewered depending on the infrastructure and regional planning.

Designated Management Agency Responsibilities:

- **Village of Swanton**: Owns and operates wastewater treatment facilities, and the collection system within the corporate limits.
- **Lucas County:** Will own and operate the collection system, if and when, any Lucas County unincorporated areas connect to the Village system for treatment services.
- **Fulton County:** Will own and operate the collection system, if and when, any Fulton County unincorporated areas connect to the Village system for treatment services. For the purpose of preserving and promoting the public health and welfare, the Board of Fulton County Commissioners, under the authority of the Ohio Revised Code (ORC) Section 6117, is responsible for maintaining and operating sanitary sewer district within the county and outside municipal corporations. The board may acquire, construct, maintain, and operate within its district facilities that it determines to be necessary or appropriate for the collection, treatment and disposal of sewage and other wastes originating in its district to comply with the provisions of the ORC Section 6117 of and other applicable provisions of the Clean Water Act. As indicted in the Fulton County Comprehensive Sewer Plan, the board will provide for sanitary sewer facilities and should contract with the county's municipal agencies for operation, maintenance and/or treatment services of any of these facilities

on behalf of the county and that may be determined by the board to be in the best interests of the county and as long as the appropriate municipal agency is capable of providing said services.

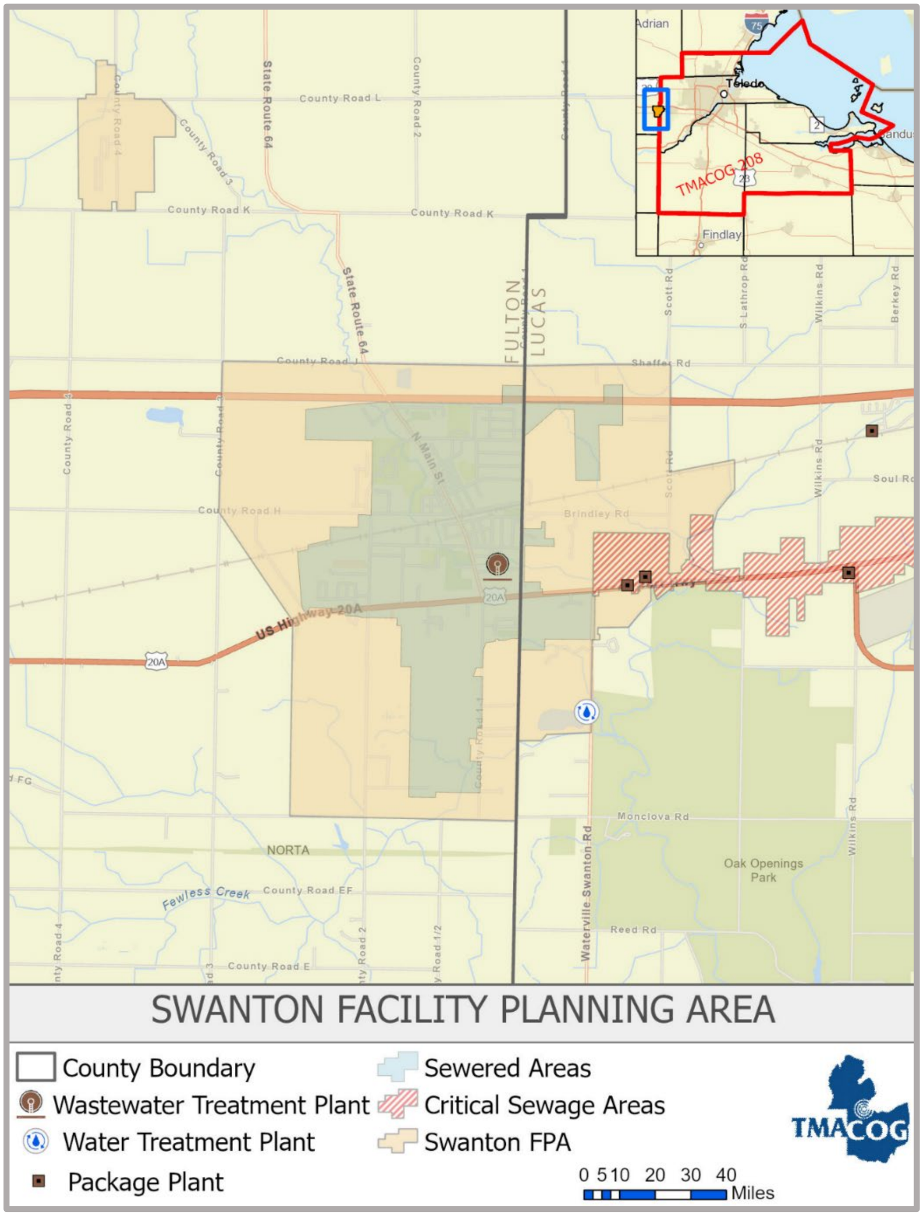


Figure 5 - 3: Swanton Facility Planning Area

Table 5 - 11: Population of communities partially or wholly within the Swanton Area Population

Area	Population
Swanton, entire jurisdiction	3,897
Swanton Township, entire jurisdiction*	2,822
Swan Creek Township, entire jurisdiction*	8,555
Fulton Township, entire jurisdiction*	3,147
Total	**18,421**

*only part of this jurisdiction is within the FPA boundary.
Source: the U.S. Census 2020 decennial census

Present Facilities

In January 2017, the Swanton Village Council approved the renaming of the facility to Swanton Water Resource Recovery Facility. Swanton is served by trickling filters and an oxidation ditch rated at 0.939 mgd. Ohio EPA data shows an average flow of 0.90 mgd and a peak flow of 2.892 mgd during the period of 2008-2012. After final settling the trickling filter effluent goes through tertiary sand filters and is then chlorinated/dechlorinated. The oxidation ditch effluent typically goes directly to chlorination, not through the tertiary filters. Disinfected final effluent is discharged to Ai Creek. The plant has a 2.5 mg retention lagoon with chlorination to reduce bypasses of combined sewage during storm events.

Plant upgrades include:

- In 2002, the plant was upgraded by replacing the trickling filter media. Sludge can be further treated at an anaerobic digester facility operated by a private contractor when needed. Geobags are currently used to dewater biosolids prior to disposal at a landfill or by land application.
- The oxidation ditch and new final clarifier were added in 2010.
- In 2015, the Village received added chemical facilities to remove phosphorus. Ferrous chloride is used to remove phosphorus.
- Phosphorus removal was put in place in 2015.
- Implemented the use of dewatering bags in November 2016
- In early 2021, the Village of Swanton contracted with an outside firm to perform a Master Plan for the WRRF.
- In 2022, engineering started on the first phase of the Master Plan for the WRRF. A new headworks will begin construction in 2023.

Table 5 - 12: Package Plants in the Swanton Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Swanton Meadows MHP (Fulton County)[A]	FU-21	Active		2PY00022	54000
Valleywood Golf Club (Lucas County)[A]	LU-65	Private	1963	No discharge	12,500

[A]Status is active

Note: Data are based on current available data as of April 2019

Issues

To date, more than 60% of the Village's sewer system is separated. The sewer system includes nine CSO points, which discharge into Ai Creek. Two storm sewer projects in the early 1990s eliminated some combined sewers. The average flow rate of 257 gallons per capita per day (gpcd) indicates that the combined sewers also have a serious I/I problem, which causes the WRRF to process a large quantity of extraneous water. As of August June 2022, the Village had completed nine storm sewer separation projects. In 2017, the Village estimated that $8.2 million in sewer system repairs and improvements would be needed to meet the CSO reduction targets.

Swanton's Long-Term Control Plan (LTCP) was approved by Ohio EPA in November 2010. The NPDES Permit set a schedule for plant improvements that were required to meet effluent limits. These have been completed, but in 2010 a new oxidation ditch and final clarifier were added to the WRRF at an estimated cost of $2.2 million. The oxidation ditch operates in parallel with the older secondary treatment unit, a trickling filter. The NPDES permit incorporates the LTCP's schedule of projects to separate the combined sewer system into storm and sanitary sewer systems. Details for the LTCP are discussed below under Future Needs and the Capital Improvement Schedule.

Swancreek Township in Fulton County is an unsewered part of the Swanton FPA that is under pressure for development. Ohio EPA believes that failed septic systems are a pollution problem in this area, but there is no documentation, and the area is not under orders. Sewer projects may proceed on a case-by-case basis. In 2014, the Village extended sanitary sewerage service to the Holiday Lane subdivision after the Fulton County Health Department determined that its septic tanks had failed.

The Fulton County Comprehensive Sewer Plan discusses two unsewered areas near Swanton for potential sanitary sewer service. One is the unincorporated town of Ai, located at the intersection of routes 4 and L in Fulton Township, and includes the adjacent mobile home park. The other is unincorporated Swancreek Township, surrounding the Village of Swanton from the south and west. The comprehensive sewer plan concluded that the Swanton system had the capacity to treat sewage from the town of Ai, but it did not have the capacity to serve Swancreek Township. Consequently in 2003, it was ruled that Ai should connect to the Village of Swanton, but that Swancreek Township should have its own treatment facility.

208 Policies for New Subdivisions in Swanton FPA

It is the policy of this Plan that all new major subdivisions in Fulton or Lucas County shall be improved with public sanitary sewers that are designed and constructed in accordance with the specifications of the Fulton or Lucas County Sanitary Engineer or other appropriate Designated Management Agency, consistent with regulations of the Fulton or Toledo-Lucas County Health Departments. Septic tanks or individual household sewage treatment systems should be discouraged for new subdivisions within the FPA boundary. New subdivisions are encouraged to connect to public sewers and be served by the Swanton WRRF. Sewers constructed for subdivisions must meet the Village of Swanton Construction Standards.

Future Needs

- Separation of combined sewers will continue. In 2017, the estimated cost of separating remaining combined sewers was $8.2 million. The LTCP schedules system separation as a series of 12 projects, the last to be completed by 2026. Separation completion is to be followed by post-construction monitoring. As of 2020, seven project segments have been completed. A timeline for future projects includes:
    - Projects 3 and 11 – Surveying/Engineering started in 2022.
    - Project 12 – This project has been moved forward to be included with Projects 3 and 11.
- As part of the LTCP for sewer separation, Swanton will perform Post-Construction Compliance Monitoring for a three-year period following the completion of construction for each project to determine if all overflow events have been eliminated and all sources of sanitary flow are being conveyed to the WWTP. A final post-construction report, including all projects should be prepared by the fall of 2028.
- Swanton is investigating further capital improvements to the wastewater treatment plant.
- In 2016, Fulton County was planning to update its Comprehensive Sewer Plan and plans to have the

process finalized in early 2021. The previous edition of that plan from 2003 recommends building sewers to serve the town of Ai and connecting them to the Swanton system for treatment services. The public health and water quality conditions that led to the 2003 recommendations exist. Alternatives that should be considered include:

    - Construct a conventional sanitary sewer system to serve the town of Ai and connect to the Village of Swanton's system for treatment services. Sanitary sewerage service along the interceptor from Ai into Swanton may or may not be available to abutting residents, depending upon the policy established by the County Sanitary Engineer.
    - Construct a conventional sanitary sewer system to serve the town of Ai and connect to a new wastewater treatment facility built to serve that area.
    - Investigate and repair or replace onsite sewage treatment systems that have failed or are not achieving current water quality standards.

- This Plan supports state and federal financial assistance to carry out these needed infrastructure improvements. The capital improvement plan for the Swanton FPA is shown in Table 5-13.

Table 5 - 13: Swanton FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs ($)						
			2024	2025	2026	2027	2028	2029	Future
Separation project 2: North Main and Brookside	Swanton	**$815,000**							**$815,000**
Separation projects 2B, 3 & 11: St. Richards Court-Fulton Street & Elm Street ***ENGINEERING***	Swanton								
Separation projects 2B, 3 & 11: St. Richards Court-Fulton Street & Elm Street	Swanton	**$2,000,000**	2,000,000						
Separation projects 8 & 9: Sanderson Avenue & West Garfield Avenue ***ENGINEERING***	Swanton								
Separation projects 8 & 9: Sanderson Avenue & West Garfield Avenue	Swanton								
Separation project 12: Centerville Road	Swanton	**$755,000**							$755,000

Post-construction monitoring report	Swanton	**$150,000**							
		$3,720,000							

Toledo Facility Planning Area

The Toledo Facility Planning Area (FPA) is a designated region within the Toledo area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Toledo (Figure 5-4). The Toledo FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. The Toledo FPA is managed by several communities which are represented by Designated Management Agencies. The responsibilities of each of these agencies are outlined below:

Designated Management Agency Responsibilities:

- **Toledo**: Owns and operates wastewater treatment facilities and collection system within its corporate limits. The wastewater treatment plant provides treatment services to all or part of the following communities in the Toledo Facility Planning Area shown in the map below (Figure 5-5).
    - **Ottawa Hills**: Owns sanitary sewers within its corporate limits, which are operated by Lucas County through an agreement with the Village.
    - **Rossford**: Northwestern Water and Sewer District (the District) owns and operates a collection system within the Rossford corporate limits.
    - **Northwood**: The District owns and operates a collection system within the Northwood corporate limits.
    - **Walbridge**: The District owns and operates a collection system within the Walbridge corporate limits.
    - **Lucas County**: Owns and operates collection system in unincorporated areas of Lucas County.
    - **Northwestern Water and Sewer District**: Owns and operates collection system in unincorporated areas of the Toledo FPA located in Wood County.
    - **Erie Township**: Under a service agreement privately-owned sanitary sewers were constructed to serve a marina in Lost Peninsula. The sewers connect to the Toledo system for treatment services. Flows are limited to 189,125 gallons per day (gpd) with a maximum flow not to exceed 300 gallons per minute (gpm).

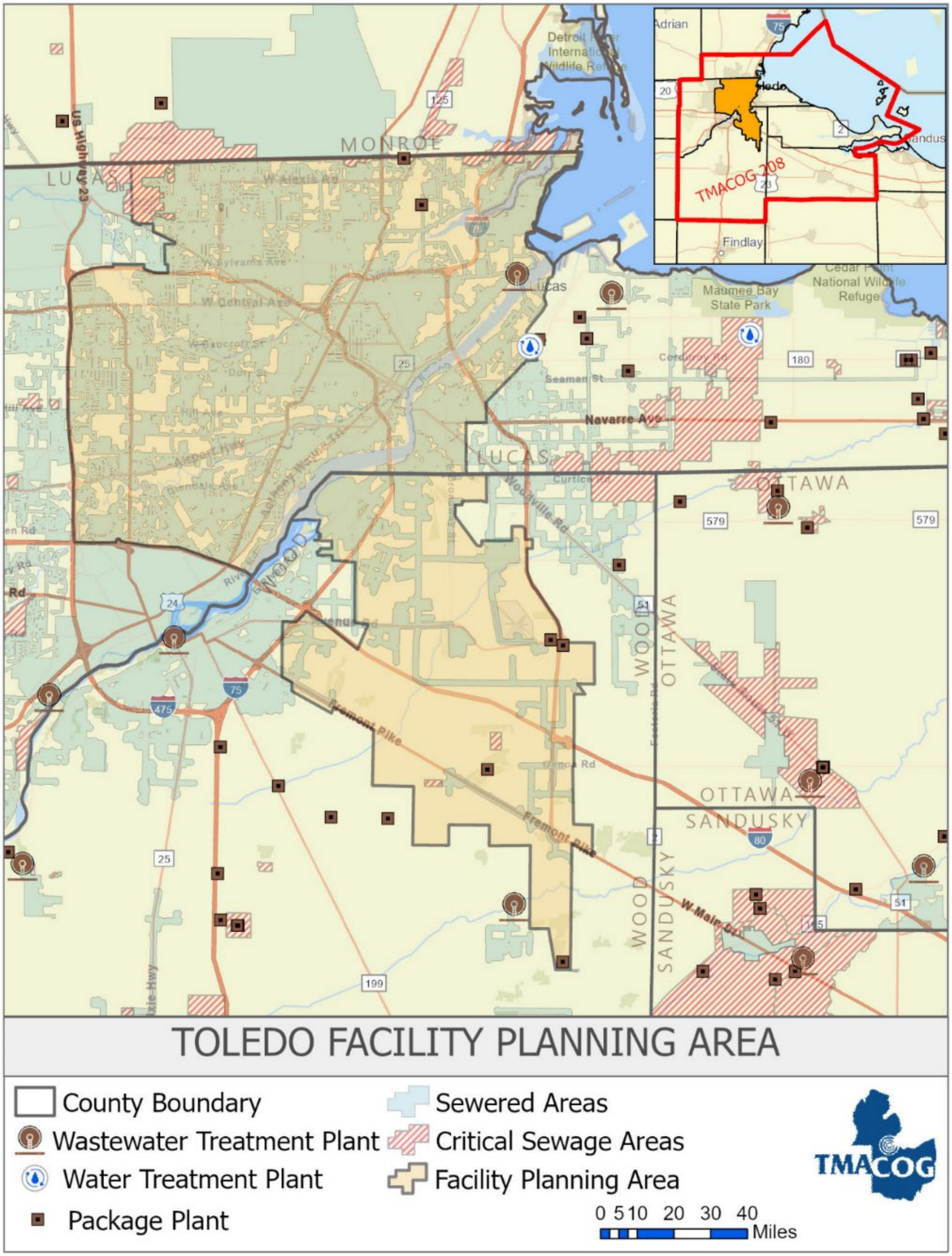


Figure 5 - 4: Toledo Facility Planning Area

Table 5 - 14: Population of communities partially or wholly within the Toledo FPA

Area	Population
Toledo	270,871
Ottawa Hills	4,790
Northwood, entire jurisdiction*	5,160
Rossford, entire jurisdiction*	6,299
Walbridge, entire jurisdiction	3,011
Lake Township, entire jurisdiction*	11,160
Perrysburg Township, entire jurisdiction*	13,571
Springfield Township, entire jurisdiction*	26,957
Sylvania Township, entire jurisdiction*	50,679
Troy Township, entire jurisdiction*	4,097
Washington Township, entire jurisdiction*	3,055
Erie Township, entire jurisdiction*	4,299
Total	403,949

*only part of this jurisdiction is within the FPA boundary.

Source: U.S Census decennial census

Present Facilities

The Toledo sewage system affects two major rivers and several smaller streams. Water quality violations of dissolved oxygen and fecal coliform are frequently recorded in the Maumee River and Estuary, Ottawa River and Estuary, and Swan, Silver, and Shantee Creeks. The main reasons for violations are combined and sanitary sewer overflows (CSOs), urban runoff, failed septic systems, and upstream heritage.

The Toledo Bay View WWTP has an average daily capacity of 130 million gallons per day (MGD); it treats the sewage from Toledo and all or portions of six adjacent jurisdictions. The ballasted flocculation facility, completed in 2007, is rated at 205 MGD for wet weather flows. The peak daily capacity of the Bay View plant is 400 MGD. Older parts of the City — about 17 square miles, or 20% of the City — are served by combined sewers, which carry both sanitary sewage and storm runoff. Presently, there are 14 CSOs along the Maumee, six along Swan Creek and three along the Ottawa River.

Ohio EPA data shows an average flow of 66.5 MGD, and a peak hourly flow of 360 MGD during the period of 2017-2022, a decline from previous levels. This reduction in flow is due to sewer system improvements, improved flow monitoring, loss of population and industry.

The City of Toledo operates an industrial wastewater pretreatment program. Starting in 2002, Toledo undertook its Waterways Initiative to further address sewage discharges to streams and increase the Bay View wastewater treatment plant's wet weather capacity. See the discussion of the Waterways Initiative under "Issues," below.

Package sewage treatment plants located in the FPA are listed in Table 5-15.

Table 5 - 15: Package Plants in the Toledo Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Globe TruckingA	LU-123	Private*	1994		1,500
Grimes Builders' SupplyA	LU-105	Private	1969	2PR00218	3,000
Otterbein-Portage Valley Retirement VillageA	WO-77	Private	1980 exp. '06	2PS00005	90,000
Pioneer 795 Truck Stop | Sunoco/SubwayA	WO-36	Private*	1966		1,500
Stony Ridge KOAA	WO-80	Private*		2PR00300	7,500

AStatus is active
*Facility type is assumed
Note: Data are based on current available data as of September 2023

Issues

City of Toledo

To abate its combined sewer problems, Toledo's first construction project was initiated in 1988. The approach was to store combined sewage for later treatment. On Swan Creek and the west side of the Maumee River in downtown Toledo, tunnels were constructed to catch the "first flush," which washes accumulated sludge out of combined sewers. The storage tunnels hold combined sewage until the treatment plant can handle it.

In 2002, Toledo and U.S. EPA reached a consent decree agreement, to be carried out over a 15-year period at a cost estimated at that time of $450 million. In 2010, when the CSO Long-Term Control Plan (LTCP) was approved, the schedule was extended to 2020. At the end of 2017, about $475 million of the improvements had been completed out of a revised total cost estimate of $521. The overall program is known as the Toledo Waterways Initiative. The program includes:

- Development and implementation of a LTCP for combined sewer overflows. The LTCP was submitted to Ohio EPA in 2005 and was approved in June 2009. The plan eliminates nine overflow locations, reduces the number of annual overflow events from 33 to between 0-3 depending on the receiving water, and reduces overflow volumes by 92%. There are 26 major projects identified in the LTCP, including combined sewage storage basins and pipelines, combined sewage tunnel improvements, flow reduction, and sewer separation. Facilities in the Chapter 5 TMACOG Areawide Water Quality Management "208" Plan 5 - 6 LTCP are located at Joe E. Brown Park, the Marina District, the Oakdale/Miami area, Toledo's south end, International Park, and Jamie Farr Park, among other areas. The following projects were completed as of August 2020: W1 (Ash/Columbus Storage Pipeline), O1 (Lockwood/DeVilbiss SSES), E6 (Wheeling Ave. SSES and Sewer Separation), W2 (Ash St. SSES and Sewer Separation), W5 (Knapp/Williams SSES and Inflow Reduction), W7 (New York St. SSES and Inflow Reduction), S3 (Highland Dr. SSES and Inflow Reduction), S4 (Woodsdale Ave. SSES and Inflow Reduction). OF (Lockwood/DeVilbiss Sewer Separation), W6 (Maumee Storage Basin), E7 (Bay View Grit Facility), O3 (Ayers/Monroe Storage/Conveyance Pipeline), E5 (Oakdale Storage Basin), S-1A (Swan Creek North Tunnel Optimization), W-4A (Downtown Tunnel Optimization), E2 (Dearborn Storage Pipeline), O-4 (Ottawa River Storage Facility), International Park Basin, and the Downtown Storage Basin.

- Wastewater treatment plant improvements to handle wet weather flows. Plant improvements completed include a 205 mgd ballasted flocculation facility, which provides primary treatment of combined sewage. It also includes a 25 mgd equalization basin and grit removal facility.

- Elimination of Sanitary Sewer Overflows (SSOs). There were three known SSOs in the Toledo system, in the Point Place area, and one on River Road. SSOs are overflows from sewers that were designed for sanitary sewage only. Because SSOs are discharges from separate sanitary sewer systems, they are a high priority for elimination. The SSOs in Point Place were eliminated in 2006 by eliminating known points of inflow, building a wet weather pump station to isolate the Point Place sanitary sewer system from the surcharged Manhattan interceptor into which it discharges, and building two pump stations and relief sewers in Point Place to convey the remaining flow. The SSO in the River Road/Midland Road area was eliminated with the construction of the 3.0 million gallon Brookford Equalization Basin in 2007.

- Sewer system analysis conducted under the Toledo Waterways Initiative turned up additional SSO points into Delaware Creek at Detroit Ave. and Erawa Road, on Mt. Vernon, in the Parkside area, on the 5th hole of the Heatherdowns golf course, at Arlington and Westwood, and on Fernhill Drive. The Erawa SSO points were eliminated in 2009 with construction of a new pump station and manhole and sewer rehabilitation. The SSO at Detroit Ave. was eliminated with the construction of an 8.0 million gallon equalization basin at Schneider Park in 2014. A 3.0 million gallon equalization tank and pump station was completed in Ottawa Park in 2012 to address the Parkside SSO. The Fernhill Drive SSO was eliminated in 2017 with the construction of a relief sewer. There are currently four active SSOs being monitored (Arlington, Heatherdowns, Penn, and Wildwood). Arlington SSO may have been eliminated during a recent sewer cleaning/lining project and is still being monitored.

Washington Township

In 2008, the Lucas County Sanitary Engineers (LCSE) completed construction of a sanitary sewer collection system and pump station serving Alexis Place. Streets along Silver Creek were not served. The pump station discharges to a City of Toledo sanitary sewer on Progress Avenue.

In summer of 2011, the LCSE contracted with RedZone Robotics to deploy a Solo unit to inspect the sanitary sewers in all of Washington Township. The entire system was cleaned ahead of this televising effort.

In 2013, the rotating assemblies of the Fullers Creekside Pump Station were replaced.

In 2017, the lining of S-408 in Washington Township was completed. This sewer serves sections adjacent to either side of I-75.

In 2018, the LCSE began the design for a sanitary sewer along Shoreland Avenue, east of Summit Street, but the assessment costs were excessive for the homeowners. In 2021, LCSE secured an H2Ohio grant, in addition an OPWC grant and installed this project at no cost to the homeowners in the project area. Utilizing these funds,19 individual home connections were also installed as part of this project. This project eliminated 35% of the septic systems along this stretch of Shoreland Avenue, many of which were failing.

Northwestern Water and Sewer District (the District)

The District serves a large part of north-central Wood County within the Toledo FPA; therefore, as sewers are constructed, they are connected to the Toledo system. The District surrounds and includes Rossford and Walbridge which are tributary to the Toledo system. Historically, this entire area was served by septic systems and package plants. Until the late 1980s, there were about 20 package plants in the Ohio Turnpike/I-280 interchange. Sewer extensions have eliminated these and many other problems. In 2014, the District added flow meters to trunk sewer connections with the Toledo system at the 60" Tracy Road sewer, at the 36" Rossford sewer, and at the 18" Northwood sewer. Sewer extensions are being studied and planned to address ongoing development and make improvements to the existing system. Sanitary sewer model of the District SS 100 service area has been constructed to determine the system reaction to wet weather flow and the impact on the Toledo East side sanitary sewer system,

The District budgets several hundred thousand to a million dollars in annual infiltration and inflow removal from the City of Rossford, Village of Walbridge, City of Northwood and surrounding area systems each year to reduce wet weather sewer flow.

Ottawa Hills

The system is located within the Village limits and is operated and maintained by the LCSE. It is the oldest system maintained by the County dating back to 1912. There are two public, and one private pumping stations located in the collection system. All the pump stations have been replaced within the last 10 years. In addition to receiving flow from Village residents, the Indian Road Trunk Sewer receives flow contributions from the City of Toledo and Sylvania Township residents.

To alleviate I/I contributions and basement flooding, the LCSE lined S-74 in 2004, located north of Indian and west of Secord Road. In 2015, the LCSE lined S-19, located just south of the Ottawa River and west of Secor Road. The LCSE has lined approximately 14,000 feet of sanitary sewers as part of ~~a~~ this $1.5M project partially funded by OPWC and the Ohio Water Development Authority (OWDA). This is the third major lining project that the LCSE has contracted in the Village of Ottawa Hills. The associated manholes are being lined as well. All totaled, the LCSE has lined over 22,000 feet of the oldest sections of sanitary sewer in the Village. The LCSE also continues to address failing laterals in the Village.

There are four unsewered lots in the Village that have petition for sanitary sewer service; these lots may be the last unsewered lots in the Village. This sanitary sewer is designed and is waiting for funding.

Walbridge

The system is owned and operated by the District, collection is via gravity system, and treatment is provided by Toledo.

Northwood

The City of Northwood is partly tributary to the Toledo system, and partly tributary to the Oregon system. The system is owned and operated by the District, collection is via gravity system, and treatment is provided by a combination of both Toledo and Oregon.

Rossford

Nearly all of Rossford connects to the Toledo system; however, a small portion to the south connects to the Perrysburg system. The system is owned and operated by the District, collection is via gravity system, and treatment is provided by a combination of both Toledo and Perrysburg. The District operates multiple sewage pumping stations, which have alleviated overflows.

Stony Ridge/ Lemoyne and Truman Road Area

Stony Ridge and Lemoyne are two unincorporated communities in Troy Township on US 20. The two communities include approximately 263 residences. Sewers to serve both communities were completed in 2012. The nearby Truman Road area along SR 420 was sewered as part of the same project. The District owns and operates sewers serving these communities; the sewers connect to Toledo for treatment services.

Jobs Ready Site (JRS) Development (Eastwood Commerce Center)

The District owns and operates the system and treatment is provided by Toledo. Home Depot has constructed a warehouse and NSG opened a new glass manufacturing facility in 2020.

Additional industrial development has occurred including the First Solar Warehouse in the former Peloton building.

Stormwater Anti-Degradation

Ohio EPA anti-degradation regulations require removal of stormwater flows from a combined system or infiltration and inflow from a separate system in order to tap new sanitary flows. The removal rate is based on peak sanitary flow rate, or 3.33 times the average flow. In 2017, Ohio EPA stated that the anti-degradation rule no longer applies to the City of Toledo since the City is implementing their approved CSO Long-Term Control Plan.

The $521 million worth of improvements to the Bay View wastewater plant and sewer collection system under the 2002 U.S. EPA consent decree are designed to meet National Pollutant Discharge Elimination System (NPDES) and water quality standards along with specific requirements contained in the consent decree (such as when the wet weather facility can be used to treat flows that are bypassed around the secondary system). The improvements are not designed to accommodate significant residential or commercial/industrial growth in the FPA in the event the prediction of a population decrease specified in Table 5-17 is not borne out. Toledo may not be able to construct improvements to accommodate significant additional flows due to the magnitude and schedule of the projects that are required to meet state and federal regulations and the consent decree. Furthermore, federal and state regulatory agencies may not permit Toledo to accept significant additional flows while it is subject to the court-approved consent decree. For this reason, Toledo's obligation to treat new flows in its FPA should be conditioned upon its ability to do so without jeopardizing compliance with the U.S. EPA consent decree, NPDES permit and water quality standards.

To meet the requirements of the U.S. EPA consent decree, Toledo was required to reduce stormwater flows received from combined sewer systems. To the extent that these flows occur in communities outside the City of Toledo, it may be necessary for the appropriate DMAs to assume responsibility for the removal of excessive flows that are directed to Toledo's wastewater treatment system.

208 Policies for New Subdivisions in Toledo FPA

It is the policy of this Plan that all new major subdivisions in Lucas County shall be improved with public sanitary sewers that are designed and constructed in accordance with the specifications of the LCSE or other appropriate DMAs, consistent with regulations of the Toledo-Lucas County Health Department. Septic tanks or individual household sewage treatment systems should be discouraged for new subdivisions within the FPA boundary. New subdivisions are encouraged to connect to public sewers and be served by the Toledo wastewater treatment plant.

All new residential subdivisions in Wood County that are required to be platted under subdivision regulations: for platted subdivisions of more than five (5) lots, septic tanks or individual household sewage treatment systems shall not be permitted within the FPA boundary. New platted subdivisions shall connect to public sewers and be served by the Toledo wastewater treatment plant.

Future Needs

The Toledo Waterways Initiative construction program is 100% complete. Rate payers supported the improvements through 9.75% annual sewer rate increases 2003-2006 and 9.9% increases 2007-2010. In 2011, a fixed fee of $15.82 per quarter was added to fund TWI projects and three percent annual increases in the non-TWI portion of the bill were approved for 2011 through 2014. In 2014, rate increases of 7.1% per year were approved for 2015 through 2019 and 7.9% in 2020. The Plan supported state and federal financial assistance for the improvements in the form of grants and loans. All 166 Consent Decree Milestones have been met and construction is complete for all LTCP projects as of August 31, 2020. The post construction monitoring period, as required by the Long-Term Control Plan, continued until March 31, 2023. The Model Verification Report was submitted to USEPA on March 31, 2024. Following the approval of The Model Verification Report, the City will prepare a 5-Year Simulation/ Performance/ Evaluation Report. Budgets for ongoing inspection, rehabilitation, and replacement of its interceptor and collector sewers have been severely reduced due to the high TWI budget requirements.

The City of Toledo contracted with Arcadis in 2021 to study needed improvements to the Bay View Wastewater Treatment Plant. In May 2022, the City of Toledo received a Facility Plan from Arcadis outlining $850 million in proposed improvements at the Bay View Wastewater Treatment Plant. The City of Toledo performed a sewer rate model study to fund the improvements. Voters overwhelmingly approved a referendum on the November 2023 ballot to make needed improvements to the Bay View WWTP and collection system. Sewer Rate increases went in affect July 10th, 2024. The proposed improvements are outlined below in Tiers 1 through 3 based on critical service priority.

Bay View WRP Proposed Improvement Plant-Wide Facilities Plan – Prioritization of Proposed Improvements

Tier 1 – Commence between 1-5 years

Solids Handling

Solids Process Building, Digesters, Gravity Thickeners
Solids building & Dewatering
Digesters & Gas System

Secondary Treatment

Chemical Facility Renovations – Construction to begin in 2025 – Separate from Facility Plan

Chlorination & Dichlorination – Construction of new chlorine facility underway- Separate from Facility Plan
Secondary RAS Pumps & Valves
Contract 44C - Tunnel Structural Repairs & RAS piping under grating in tunnel

Lab Relocation

Wet Weather Treatment
Wet Weather Facilities Flushing Gate Rehab

Collection System (Pump Stations)
Windermere Pump Station
Eastside Pump Station
Eastside Siphon
Bay View Pump Station
Reynolds Pump Station
CSO Basin Grit Mixing Systems (International Park)
CSO Basin Grit Mixing Systems (Oakdale, Maumee & Downtown)
20 Smaller Pump Stations Pump Station Maintenance Fund

Electrical and I&C
Main Equipment Building Electrical Upgrades
SDF Facility Incoming Power Distribution Equipment Upgrade
SCADA Hardware/Software and Network Fiber/Copper Upgrade
Access Control System

Tier 2 – Commence after 10 years

Primary Treatment
Eight new primary clarifiers at existing digester's location
Grease Separation Tank Replacement

Secondary Treatment
Remaining RAS piping & valves
Replace Remaining Secondary Pumps (WAS, Mixed Liquor, Primary Effluent)
Secondary valves, gates and tank drain valves
Clarifier Mechanism Replacement
Refurbish Blowers

Wet Weather Treatment
Wet Weather Facilities Recommended Improvements

Collection System (Pump Stations)
20 Smaller Pump Stations

Pump Station Maintenance Fund

Electrical and I&C
Access Control System

Tier 3 – Commence Between 5-10 Years

Secondary Treatment
Replace Blowers
Aeration Tank Baffles
Phosphorus Monitoring
Option 2 - New Final Effluent channel and Chlorine Contact Tank

Wet Weather Treatment
Equalization Basin Flushing Gate Installation

Collection System (Pump Stations)
TWI Storage Basin Pump Stations (6 older stations)
Pump Station Maintenance Fund

Electrical and I&C
Plantwide Lighting Upgrades
Access Control System

Other Plant Projects
Other plant projects Regulatory, electrical, HVAC, plant water, misc. etc.

Table 5 - 16: Table BVWWTP Estimated Facility Plan Expenditures

Tier	Amount
1	$328,950,300
2	$219,097,000
3	$78,692,000
Year	**Amount**
2025	86,426,800
2026	27,879,500
2027	11,044,000
2028	500,000
2029	203,100,000
2030	217,097,000
2031	500,000
2032	500,000
2033	500,000
2034	500,000
2035	78,692,000
Total	$626,739,300

Table 5 - 17: Major Sewage Improvements Completed for the Toledo FPA

Project	Cost ($ Millions)	Completion Date Projected Date
CSO Telemetry system to monitor overflows	$0.07	1976
Tenmile Creek Interceptor relief sewer; modified Ottawa River CSO regulators; added tide gates	$48.6	1982
Downtown CSO Phases 1 and 2	$13.6	1990
Swan Creek CSO Phases 3-7	$31.4	1991-1996
Point Place SSO Phase I	$4.1	2000
Point Place SSO Phase II	$20.0	2006
River Road Phase I	$11.7	2007
River Road Phase 3A	$2.7	2006
Parkside SSO Improvements	$2.3	2007
Paine/Westside Interceptor Rehabilitation	$2.9	2007
Detroit SSO Elimination	$12.6	2012
Parkside SSO Elimination	$12.8	2014
Arlington/Heatherdowns SSO Elimination	$2.1	2017
Lockwood/DeVilbiss Illicit Discharge Elimination	$1.0	2017
CSO Optimization Projects		
Installed tide gates on 20 regulators (Maumee, Swan)	$0.4	1988
Hawley and Ewing CSO regulator improvements (Swan)	$2.1	1989
Lockwood — improvements to control extraneous flow (Ottawa)	$0.1	1997
Williams — partially separated area by removing stormwater from overflows (Maumee)	$1.5	1998
DeVilbiss — partially separated area by removing stormwater and closing the overflow (Ottawa)	$0.3	1997
Woodsdale — regulator improvements reducing CSO volumes (Swan)	$1.7	2000
Lagrange — partially separate by redirecting flow from large sanitary area to interceptor (Ottawa)	$1.5	2000
Columbus — Partial separation of CSO #23 area by redirecting flow from large sanitary area to interceptor (Maumee)	$3.0	2002
Bay View WWTP Projects		
Chlorination/Dechlorination System Improvements – Renovated the existing chlorination system and added a chlorine contact tank and dechlorination facilities.	$3.6	1994
Aeration System Improvements – Replaced existing aeration tank (AT) diffusers and added first pass feed pumps to ATs 7, 8 & 9	$2.8	1995
Solids Handling Control System Improvements	$0.5	1996
Final Tank #12, I-4B – Constructed an additional final tank and rebuilt 3 control houses	$6.7	1997
Belt Filter Press Control Panel Replacement	$0.39	1996
Belt Filter Press Rebuilds	$1.0	1998-2000

Project	Cost ($ Millions)	Completion Date Projected Date
Ferrous Chloride and Polymer System Renovations – Replaced existing tanks, added a contained unloading station and additional dry weather ferrous chloride pumps	$0.9	1999
PLC-3 Replacement Project – Upgraded obsolete PLC-3 processors with PLC-5 processors, installed fiber optic network	$0.55	1999
East Side Pump Station (ESPS) Electrical Renovation, I-3A – Renovated the complete electrical system at the ESPS	$1.2	1999
Bay View Pump Station (BVPS) & Primary Tanks (PT) Electrical Renovation – Renovated the complete electrical system at the BVPS & PTs	$3.34	2000
Secondary Renovations, I-44 – Renovated the existing 11 final tanks and 9 aeration tanks including new electrical service, valve actuators, safety handrails, concrete repairs, inlet valves, air flow meters and a new control house	$11.2	2002
Skimming Tank Separation Project, I-45 – Separate the existing two pass skimming tanks into four single pass tanks includes new electrical service to grit and skimming tanks, concrete repairs and safety handrails	$4.65	2001
Major Pump Station Renovation, I-46A, B & C – Includes the structural and mechanical renovation of the ESPS & BVPS and the complete renovation of the Windermere PS	$4.5	2002
Filling of the Mooring Basin, I-47A – Basin area is needed for additional plant expansion.	$8.2	2003
Wet Weather Treatment Facility, I-47B-Includes final effluent pump station and a new wet weather treatment facility designed to provide a minimum of equivalent primary treatment and disinfection to flows exceeding treatment plant capacity	$32.76	2006
Equalization Basin Land Acquisition, I-48A	$6.4	2003
Equalization Basin, I-48B-Includes the construction of a 25.0 MG basin, odor control, pump station and preliminary treatment	$28.0	2006
Secondary Back-up Power-Provide back-up electrical power for secondary treatment and all new construction	$3.8	2004
Blower Renovation-Includes the replacement of existing diesel driven blowers	$5.32	2005
Ballasted Flocculation Facility	$40.45	2007
New Chlorine Facility	$16.47	2025
I-66 Chemical Building Improvements	$13.5	2026

CSO Long-Term Control Plan projects and their status are listed in Tables 5-18. The capital improvement plan for the Toledo FPA is shown in Table 5-19.

Table 5 - 18: CSO Long Term Control Plan Improvements Planned for the Toledo FPA

	Ottawa River Projects in the Recommended Plan	
Project	Project Description	Construction Cost
Identifier		($M)
O-1 Completed	Study of the Lockwood (64) and DeVilbiss (63) regulator tributary areas. Objective: identify work required to completely separate the tributary areas, remove inflow sources from the existing sanitary. Project is part of the Bennett Area SSES.	$3.0
O-2 Completed	Lockwood and DeVilbiss sewer separation. Work includes extension of sanitary and storm sewer as needed to accomplish separation. Regulators would be abandoned. Private inflow sources would be removed (by property owner). May include replacement of some sanitary sewer lines on Sylvania and Berdan. May include storm water quality ponds at the outlet. May be implemented in several contracts or projects as determined by the study (project O-1). Follow-up project certification effort to confirm all inflow sources removed.	$17.7
O-3 Completed	Monroe (67) and Ayers (65) collector sewer study; design and construction. Rehabilitate or replace the sewer on the south side of the Ottawa River from Monroe to Ayers. Add new overflow location with floatable control and backwater protection. Abandon existing outfalls. Alternative will create 0.3 MG of pipeline storage/conveyance and make use of 1.1 MG of pipeline storage/conveyance.	$9.5
O-4 Completed	Ottawa River South Storage Basin. Approximately 14.0 MG basin near Joe E. Brown Park.	$68.8
	Total	$99.0
	Maumee River Westside Projects in the Recommended Plan	
W-1 Completed	Pipeline Storage Facility adjacent to Jamie Farr Park. Project includes pre-study; design; construction; and post-construction evaluation of pipeline storage facility to limit discharge frequency, volume, and pollutant load from outfalls 23 through 25. The facility would be located adjacent to the Maumee River near Jamie Farr Park and would consist of a single pipeline. Approximate storage volume of 1.1 MG would be provided. Flow to the pipeline storage facility basin is anticipated to be gravity influent and gravity or pumped dewatering. The CSOs would be consolidated so that the outfall from the discharges would be located near the existing CSO 23 discharge. Regulator and return line modifications will be provided at existing locations with floatable control and backwater prevention added at the overflow from the pipeline storage system.	$6.4
W-2 Completed	Ash to Interceptor sewer separation project. This project would separate the combined area that is directly tributary to the interceptor at Ash.	$2.7
W-4C Completed	Downtown Tunnel Storage. Pipeline or tank Storage Facility extending from the Galena (26) CSO to the existing downtown tunnel. Project includes pre-study; design; construction; and post-construction evaluation of pipeline storage facility to limit discharge frequency, volume and pollutant load from outfall 26 and the existing downtown	$43.9

	Ottawa River Projects in the Recommended Plan	
Project	Project Description	Construction Cost
Identifier		($M)
	tunnel. An approximate storage volume of 2.2 MG would be provided. Facility would be located in the existing Water Street right-of-way (extended to Galena). The outfall from CSO 26 would be eliminated. Regulator and return line modifications will be provided.	
W-4A Completed	Downtown Tunnel Optimization. This project includes modifications to the existing Downtown Tunnel and associated regulators to reduce overflow frequency and volume and provide enhancement of the existing tunnel system operation. Specific project elements include addition of in-system storage devices upstream of regulators 28, 29, 30 and 31 (providing approximately 1.0 MG of additional storage), modifying the regulator associated with CSO 27 (to better direct flow to the tunnel system), clean the tunnel of accumulated sediment, add floatable control and backwater protection to remaining CSO discharges, improve monitoring, and improve other tunnel operational characteristics. In addition, localized sewer system modifications to enable elimination of the overflow location at Madison and the Maumee River would be implemented.	$9.3
W-5 Completed	William and Knapp Area SSES, inflow removal and Regulator 32 abandonment. This project will investigate steps necessary to eliminate CSO 32. This area previously was separated but private inflow was not addressed. The regulator remains open and may discharge.	Part of Ash
W-6 Completed	Maumee Ave. Storage Basin	$6.7
W-7 Completed	New York Area SSES. This project includes SSES projects and inflow reduction projects in formerly separated areas. The regulators for these areas were removed, but no specific assessment of the remaining wet weather flows was conducted. The projects identified include New York (old 22).	Part of Wheeling
	Total	$69.0
	Maumee River Eastside Projects in the Recommended Plan	
E-1 Completed	Modification to the Paine (4) regulator and return line to allow increased transport of CSO flows to the Eastside Interceptor. Limited sewer separation in portions of the Paine CSO tributary area to reduce incidence of basement backup and reduce CSO tributary area. Additional floatable control and backwater protection to the discharge.	$2.1
E-2 Completed	Dearborn Storage Basin. Approximately 1.0 MG storage basin.	$16.7
E-3 Completed	International Park Pipeline Storage Facility. Project includes pre-study; design; construction; and post-construction evaluation of pipeline storage facility to limit discharge frequency, volume, and pollutant load from outfalls 6 and 7. The facility would be located in International Park (probably along the eastern border) and would consist of one or dual box culverts to provide storage. Approximate storage volume of 4.9 MG would be provided. Flow to the pipeline storage facility basin is anticipated to be gravity influent and gravity or pumped dewatering.	$24.9

	Ottawa River Projects in the Recommended Plan	
Project	Project Description	Construction Cost
Identifier		($M)
	Pipeline storage would operate in a first flush configuration, with any discharge occurring at existing overflow locations. Regulator and return line modifications will be provided at existing outfalls with floatable control and backwater prevention added at these locations.	
E-4	Modification to the Fassett (8) regulator and return line to allow increased transport of CSO flows to the east side interceptor. Additional of floatable control and backwater protection to the discharge.	$1.9
E-5 Completed	Oakdale Storage Basin - Approximately 8.0 MG storage basin.	$21.6
E-6 Completed	Wheeling Area sewer separation. The Wheeling area is combined but not controlled by a regulator. The size of the area is limited. The Wheeling area sewer separation project would reduce the wet weather flow directed to the East Side Interceptor.	$2.9
E-7 Completed	Bay View Grit Facility	$20.2
	Total	$90.3
	Swan Creek Projects in the Recommended Plan	
S-1A Completed	Swan North Tunnel Optimization. This project includes modifications to the existing Swan North Tunnel and associated regulators to reduce overflow frequency and volume and provide enhancement of the existing tunnel system operation. Specific project elements include addition of in-system storage devices upstream of regulators 43 and 47 (providing approximately 0.8 MG of additional storage), modifying the sewers associated with CSO 47 (to better direct flow to the tunnel system), clean the tunnel of accumulated sediment, add floatable control and backwater protection to remaining CSO discharges, improve monitoring, and improve other tunnel operational characteristics.	$6.2
S-1B Completed	Swan Creek North Sewer Separation	$13.9
S-2A Completed	Swan South Tunnel Optimization. This project includes modifications to the existing Swan South Tunnel to control the discharge of floatable and improve operation of the tunnel system. Work would include cleaning the tunnel of accumulated sediment, addition of floatable control and backwater protection to remaining CSO discharges, improved monitoring, and improvement of other tunnel operational characteristics.	$3.6
S-3 Completed	Highland (Regulator 50) sewer separation. The separation of the area tributary to regulator 50 would be implemented to reduce the total tributary area to the Swan South Tunnel system, hence increasing the percentage of volume captured by the tunnel system for this tributary area.	$1.4
S-4 Completed	Woods dale SSES and inflow reduction project. This project includes SSES projects and inflow reduction projects in formerly separated areas. The regulators for these areas were removed, but no specific assessment of the remaining wet weather flows was conducted. The	$1.2

	Ottawa River Projects in the Recommended Plan	
Project	Project Description	Construction Cost
Identifier		($M)
	projects identified include the woods dale area (old Regulator 49).	
	Total	$26.3

Table 5 - 19: Toledo FPA Capital Improvement Schedule

Project	DMA	Total Cost($)	Annual Capital Improvements Needed ($)						
			2024	2025	2026	2027	2028	2029	Future
SS 100 Sewer Rehabilitation3	Northwestern Water and Sewer District	3,000,000	1,000,000	500,000					1,500,000
Rossford I&I Removal	Northwestern Water and Sewer District	$3,900,000	1,900,000	1,700,000					1,000,000
S-124 Talmadge Road Lining	Lucas County - Ottawa Hills	$1,000,000	500,000	$1,000,000					
S-897 Shoreland Avenue	Lucas County - Washington Township	$550,000							
Ottawa Hills Lateral Lining	Lucas County - Ottawa Hills	$500,000							
Collection System Renovations & Upgrades	Toledo	$310,000	310,000						
Blower Balance/Repair	Toledo	$200,000	200,000						
Primary Electrical Wiring & Actuator Replacement	Toledo	$600,000	600,000						

Project	DMA	Total Cost($)	Annual Capital Improvements Needed ($)						
			2024	2025	2026	2027	2028	2029	Future
Solids Handling Renovations, Upgrades & Tank Cleaning	Toledo	5,425,000	2,850,000	2,575,000					
Aeration Tank Cleaning	Toledo	150,000		150,000					
Pumps & Valves Rebuild/ Replacement	Toledo	725,000	575,000	150,000					
BVPS Drives – Engineering	Toledo	150,000		150,000					
Cleaning and Televising Program	Toledo	3,500,000	1,500,000		2,000,000				
Rehabilitation and Lining and/or Replacement (36" and under)	Toledo	5,200,000	500,000	1,500,000	1,500,000	1,700,000			
Rehabilitation and Lining of Large Diameter Sewer (+36")	Toledo	10,000,000	2,500,000	2,500,000	2,500,000	2,500,000			
Sanitary Sewer Replacement Misc.	Toledo	5,300,000	1,700,000	1,000,000	1,200,000	1,400,000			
Large Diameter Sewer Inspection (+36")	Toledo	700,000		700,000					
Totals		$41,210,000							

MONROE COUNTY FACILITY PLANNING AREAS

Last Updated, 2024

Bedford Township Facility Planning Area

The Bedford Township Facility Planning Area (FPA) is a designated area within Bedford Township, Michigan, where wastewater management and treatment are planned and coordinated. The FPA outlines the boundaries within which the wastewater treatment facilities are expected to operate to ensure that infrastructure meets the community's needs (Figure 5-5). The goal is to address wastewater management effectively while considering environmental impacts, regulatory compliance, and long-term sustainability. Portions of the area may be serviced by other FPAs or may remain unsewered based on local planning decisions. Designated management agencies (DMAs) are the local agencies that are responsible for management of treatment plants and wastewater collection infrastructure.

Designated Management Agency Responsibilities:

- Bedford Township: Owns the wastewater collection and treatment system.
- Monroe County Drain Commissioner: Operates and administers the sewage system under an agreement with Bedford Township.

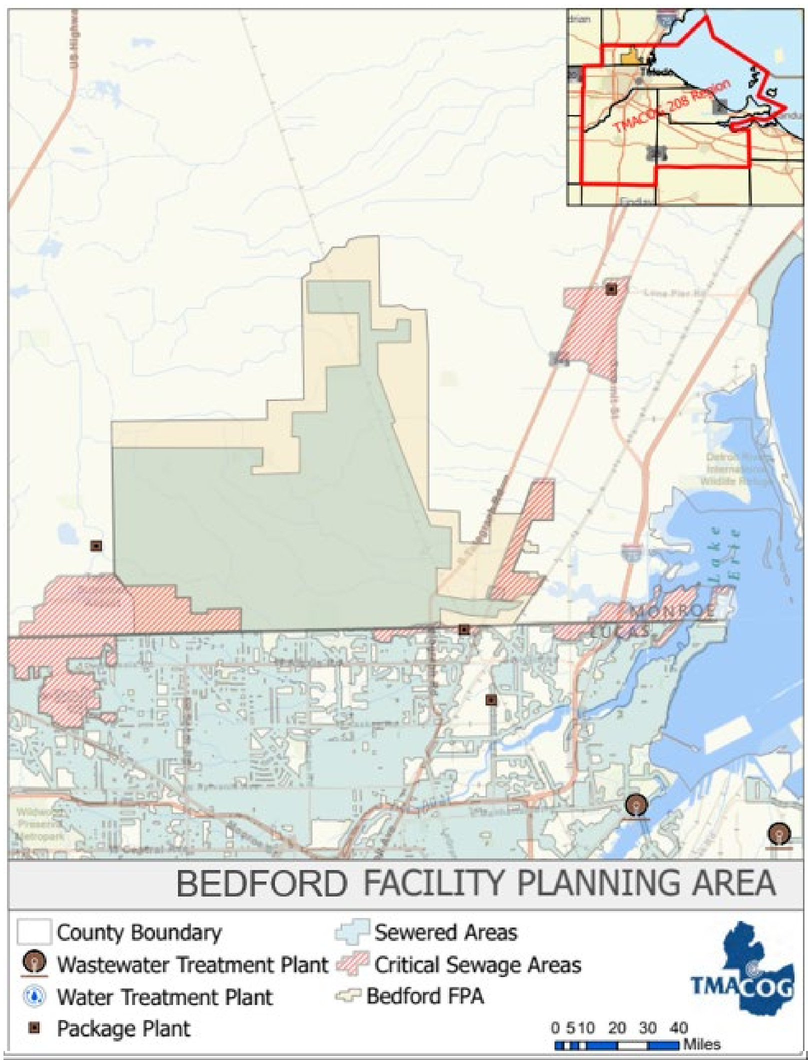


Figure 5 - 5: Bedford Township Facility Planning Area

Table 5 - 20: Population of communities partially or wholly within Bedford Township FPA

Area	Population
Bedford Township, entire jurisdiction *	31,813
Erie Township, entire jurisdiction*	4,299
Whiteford Township, entire jurisdiction*	4,590
Total	**40,702**

*only part of this jurisdiction is within the FPA boundary.
Source: U.S. Census 2020 decennial census

Present Facilities

The Bedford WWTP has a capacity of 6.0 million gallons per day (mgd). It had an average daily flow of about 2.5 mgd in 2014. Peak flow rates can exceed 10 mgd, and the plant occasionally treats flows up to its hydraulic capacity of 13.2 mgd. The Bedford WWTP operates an industrial wastewater pretreatment program.

The Bedford Township WWTP was constructed in 1971 and is located on the Southeast side of the Township on LaVoy Road. This original facility consisted of administration and blower buildings that contain barminutors, raw influent pumps and low-pressure air blowers for process air, grit and primary clarifier tanks, a pressure filtration tank, two aeration tanks and aerobic digestion tank, two final clarifier tanks with a surge tank for high flows, one chlorine contact tank, six sludge drying beds. The plant was expanded in 1978 to a design capacity of 2.9 mgd. This expansion consisted of a new primary clarifier tank, additional raw influent pump and barminutor, a blower, three pressure filtration tanks, six aeration tanks, final clarifier tanks, chlorine contact tank and sludge drying beds; and a new digester control building and digester tanks. In 1994, another expansion took place to bring the WWTP up to a capacity of 6.0 mgd and included additional primary clarifier tanks, a pressure filter and aeration tanks; increased the size of the existing chlorine contact tanks; and added two larger final clarifier tanks. The WWTP is a conventional mechanical plant that provides tertiary treatment for the residential, commercial and industrial users in the Township. There is no septage receiving facility at the current WWTP.

In 2001, the Residual Management Plan for Land Application of Biosolids was approved and the Township started to use land application for their biosolids disposal. In approximately 2007, an above ground sludge storage tank was added to allow for additional sludge holding time prior to land application of the processed sludge in conjunction with the occasional use of some of the sludge drying beds.

In 2005, an 850,000-gallon sludge storage tank was built, including a new truck filling station. In 2011, a new head works building was built. It included a Duperon FlexRake screening system (which eliminated the need for the old barminutors), five new 35 horsepower (hp) raw pumps which replace the three old pumps (one 250 hp pump and two 150 hp), and a new Vortex grit removal system. In 2012, the blowers for the aeration system were replaced with two Turblex blowers.

The collection system located within Bedford Township is composed of separate sanitary sewers that discharge directly to the WWTP with no direct outlets into any drains, rivers or streams that are known. The initial sanitary sewer system was completed in 1971 and consisted of approximately 58 miles of various sized sewer pipes. Since then, the mainline sewer system has been expanded to the current system that consists of about 100 miles of sanitary sewer in the Township. Majority of the system is gravity with six pump stations within the system and are located at: 1) Smith and Lewis Road; 2) Smith and Douglas Road; 3) Monroe Road north of Clegg Road; 4) Crystal Water located on Douglas north of Steams Road.; 5) Country Club Villis on Smith Road west of Douglas and 6) Legacy on Valetta Road north of Temperance Rd.

Issues

With over 40,000 people and more development predicted, Bedford Township is the most populous Toledo suburb. Bedford Township's rising population continues to increase the demand for wastewater treatment capacity. The present service area includes developed portions of Bedford Township and a portion of Erie Township.

The majority of the plant equipment is near the end of its useful life, ranging from 30 to 40 years, many areas of the plant need to be upgraded. Continuing efforts are also needed to identify and eliminate sources of inflow and infiltration from the collection system.

Future Needs

- Extraneous water entering the collection system is an ongoing problem. Monroe County has a program to identify and eliminate infiltration and inflow (I/I) including:
    - The County has walked, visually checked, and smoke tested all the interceptors that follow the County drains and corrected the problems found.
    - Slip lining of approximately 2,400 feet of sanitary sewer on Barbara Lee and Sandra Kay Drives.
    - The County will continue with the current program of manhole inspections and sewer televising for illicit connections and pipe problems on an as needed basis.
- In 2009, a Facilities Plan was prepared to provide recommendations, costs, and priorities for replacement or rehabilitation for several wastewater plant components. The first phase improvements were completed by 2011. In 2015, the second phase improvements were planned and completed in 2020. This involved the following activities:
    - Replace the existing chlorine gas and dichlorination systems with new disinfection system, to be determined (Phase 2)
    - A new HVAC system for the Blower Building (Phase 2)

Currently, Bedford Township has not submitted capital improvement plans for inclusion in the TMACOG 208 Plan.

Erie Facility Planning Area

The Erie Peninsula Facility Planning Area (FPA) is a designated area within Erie Township in Michigan, where wastewater management is planned, coordinated, and regulated. Sewers are limited in this area and the FPA does not operate wastewater treatment facilities (Figure 5-6). Instead, wastewater management is coordinated with neighboring FPAs. Most of the land area in the Erie FPA is classified as a critical sewered area (CSA), meaning that the area has documented concentrations of failed or failing onsite sewage systems. The FPA is managed by designated management agencies in Erie Township. The total population of Erie Township in 2020 is 4,299 (Table 5-22).

Designated Management Agency Responsibilities:

- **Erie Township:** Should a sewage project in Erie Township be initiated, the Township would be responsible for planning, construction, and operation of a collection system, and a wastewater treatment facility if required.

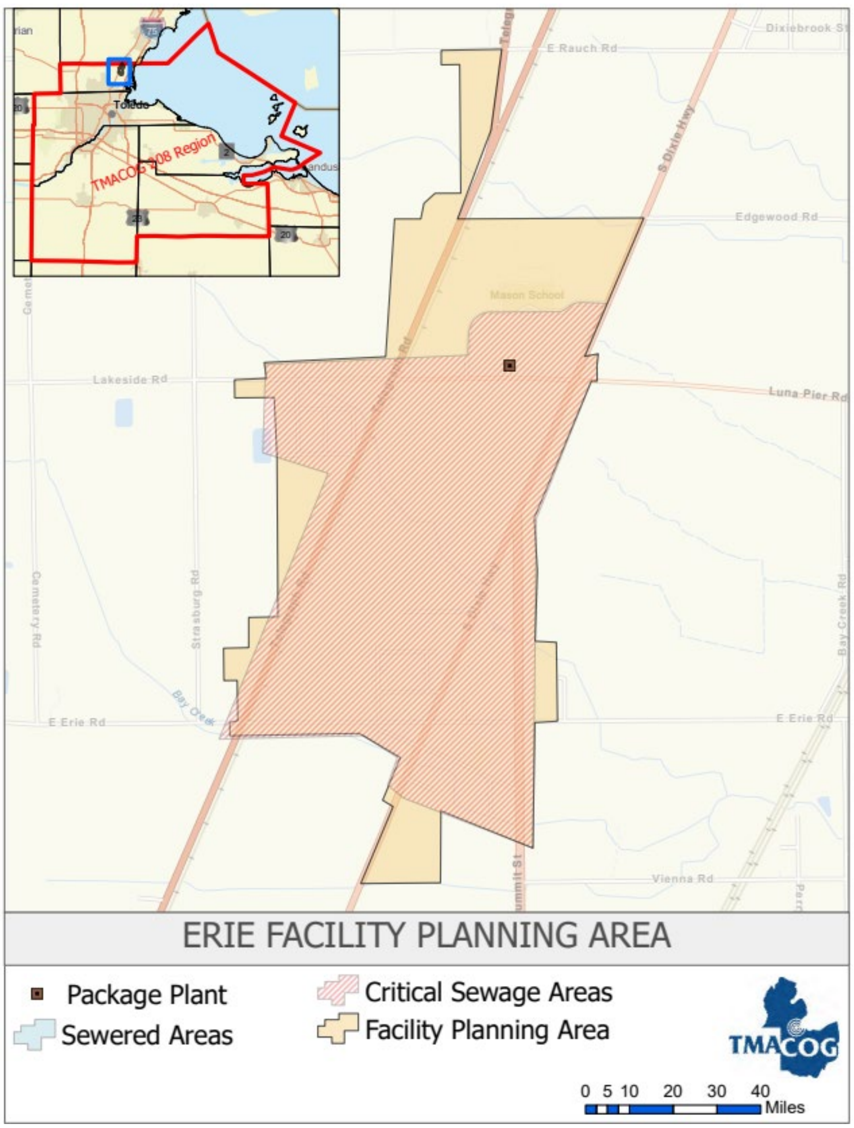


Figure 5 - 6: Erie Facility Planning Area

Table 5 - 21: Erie Area Population

Area	Population
Erie Township, entire jurisdiction*	4,299
Total	**4,299**

*only part of this jurisdiction is within the FPA boundary.
Source: U.S. Census 2020 decennial census

Present Facilities
Erie is an unincorporated town in Erie Township. There is no public sewerage system: all businesses and residences are served by individual on-site systems. There is one package plant, which serves the school district (Table 5-22).

Table 5 - 22: Package Plants in the Erie Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Mason Consolidated Schools[A]	MO-05	Private*	1992	MI047201	35,000

[A]Status is active
*Facility type is assumed
Note: Data are based on current available data as of April 2019

Issues
Most of the planning area has been designated as a Critical Sewage Area by the Monroe County Health Department (Figure 5-6). The individual septic systems are susceptible to failure due to poor soil conditions. The community's small lot sizes do not allow room for onsite sewage systems that meet today's standards.

Future Needs
If a significant number of individual septic systems fail, a public sanitary sewerage system may be required. The sewage treatment options that should be considered are connecting to the Luna Pier system via force main or constructing a new wastewater treatment plant.

This Plan supports state and federal financial assistance for planning, design, and construction of a sewerage system, when required.

Currently, Erie Township has not submitted capital improvement plans for inclusion in the TMACOG 208 Plan.

Erie Peninsula Facility Planning Area

The Erie Peninsula Facility Planning Area (FPA) is a designated area within Erie Township in Michigan, where wastewater management is planned, coordinated, and regulated. Sewers are limited in this area and the FPA does not operate wastewater treatment facilities. Instead, wastewater management is coordinated with neighboring FPAs. Most of the land area in the Erie Peninsula FPA is classified as a critical sewered area (CSA), meaning that the area has documented concentrations of failed or failing onsite sewage systems; The FPA is managed by designated management agencies in Erie Township. The ototal population of Erie Township in 2020 is 4,299 (Table 5-23)

Designated Management Agency Responsibilities:

Erie Township: Should a sewage project in Erie Township be initiated, the Township would be responsible for planning, construction, and operation of a collection system, and a wastewater treatment facility if required.

Figure 5 - 7: Erie Peninsula Facility Planning Area

Table 5 - 23: Erie Peninsula Area Population

Area	Population
Erie Township, entire jurisdiction*	4,299
Total	**4,299**

*Only part of this jurisdiction is within the FPA boundary.

Source: U.S. Census 2020 decennial census

Present Facilities

Monroe County borders the City of Toledo, with the state line running through north Maumee Bay. On the bay's south shore are three peninsulas located in Michigan but have land access only through Ohio. The peninsulas, west to east, are Morin Point, McLeary's Point, and Lost Peninsula, respectively. There are no public wastewater treatment facilities in the planning area. Residences are served by individual onsite systems. In Lost Peninsula, a marina is served by privately-owned sewers that connect to the Toledo system for treatment services. These sewers were built under an agreement signed in 1993, and service is limited by flows of 189,125 gallons per day (gpd) with a maximum flow not to exceed 300 gallons per minute (gpm). There are no package sewage treatment plants located in the FPA.

Issues

Most of the planning area has been designated as Critical Sewage Areas by the Monroe County Health Department. The individual septic systems are susceptible to failure due to poor soil conditions and high-water tables. The community's small lot sizes do not allow room for on-site sewage systems that meet today's standards. Houses on the peninsulas were originally built as recreational summer homes. Many, especially in Lost Peninsula, have since become permanent residents.

Future Needs

If a significant number of individual septic systems fail, a public sanitary sewage system may be required. The sewage treatment options that should be considered are connecting to the Toledo system or constructing one or more new wastewater treatment plant(s).

This Plan supports state and federal financial assistance for planning, design, and construction of sewerage systems, when required.

Currently, Erie Peninsula Township has not submitted capital improvement plans for inclusion in the TMACOG 208 Plan.

Luna Pier, Erie-Lasalle Township Facility Planning Area

The Luna Pier, Erie-LaSalle Township Facility Planning Area (FPA) is a designated area within Luna Pier, Erie-LaSalle Township in Michigan, where wastewater management is planned, coordinated, and regulated (Figure 5-8). Sewers are limited in this area and the FPA does not operate wastewater treatment facilities. Instead, wastewater management is coordinated with neighboring FPAs. This FPA is responsible for the planning and coordination of wastewater management and treatment within these areas. City of Luna Pier, Erie Township, and LaSalle Townships coordinate to manage the FPA.

Designated Management Agency Responsibilities:

- **City of Luna Pier**: Owns and operates wastewater treatment facilities, and collection system within the corporate limits.
- **Erie Township:** Should a sewage project in Erie Township be initiated, the Township would be responsible for planning, construction, and operation of a collection system, connecting to the City

system for treatment services.

- **LaSalle Township:** Owns and operates collection system outside the corporate limits in North Shores and Grandview Beach, connecting to the City system for treatment services. This area is covered by the SEMCOG Areawide Water Quality Management Plan, included here for completeness of this FPA.

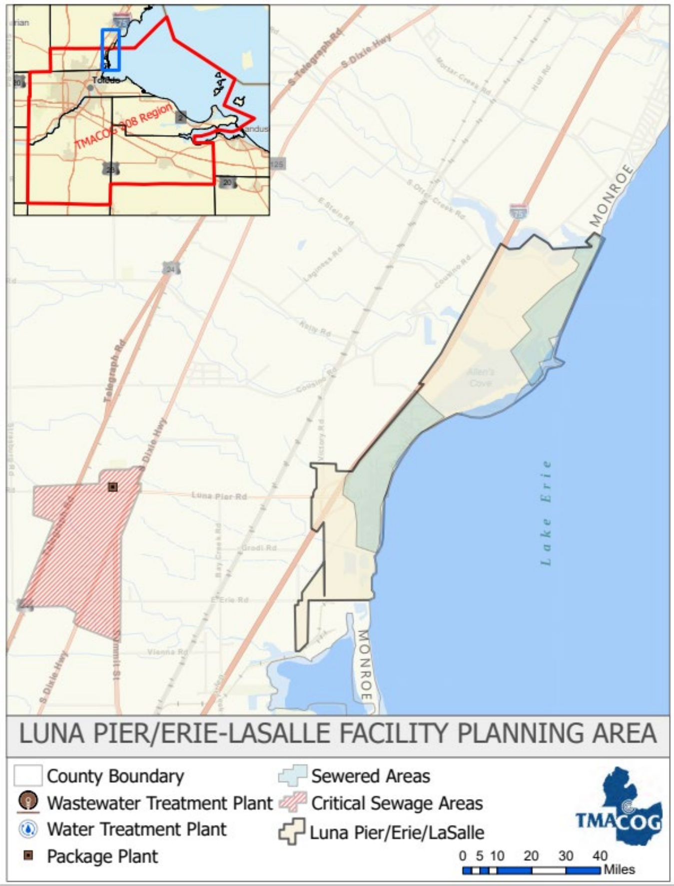


Figure 5 - 8: Luna Pier/Erie-LaSalle Township Facility Planning Area

Table 5 - 24: Luna Pier/Erie-LaSalle Township Population

Table 5-25: Population of communities partially or wholly within the Luna Pier/Erie-LaSalle Township FPA	**Population**
Luna Pier	1,382
Erie Township, *	4,299
La Salle Township, *	4,639
Total	**10,320**

*only part of this jurisdiction is within the FPA boundary.
Source: U.S. Census 2020 decennial census

Present Facilities

The City of Luna Pier has an activated sludge wastewater treatment plant with grit removal, primary and final sedimentation, aeration, anoxic zone, effluent chlorination, gravity sludge thickening and storage. Average daily flow capacity is 0.348 million gallons per day (mgd), and 0.696 mgd peak. The discharge enters Lake Erie via LaPointe Drain. The WWTP was constructed in 1969 and expanded in 1990 and 2013.

The 1990 plant expansion allowed for the Lakeshore Area of LaSalle Township, which included the areas of North Shores and Grandview Beach Subdivisions along with the North Cape Yacht Club. The Toledo Beach Marina Area was not included in this project.

The 2013 plant upgrade added an automated screen, a second primary and final clarifiers, replaced three raw sewage pumps and three return sludge pumps, replaced and relocated de-gritting system, abandoned flash mixer, replaced backup generator, added two aeration tanks, converted the existing aeration tank to anoxic tank, added two blowers, and added an auxiliary chlorine contact tank.

Issues

The Luna Pier plant receives a substantial amount of infiltration and inflow (I/I), an estimated 44% of its total flow. The system does not have sanitary sewer overflows (SSOs), but one plant bypass has been recorded. The bypass has since been removed, as part of the 2013 upgrade.

In 2014, a flow monitoring study was conducted. Overall, the flow monitoring study (SSES) showed that I/I is present throughout the City's sanitary sewer collection system. Infiltration is prevalent due to the high groundwater table resulting from its location next to Lake Erie. The wet- versus dry-weather data showed that none of the areas monitored experienced peak wet-to-dry ratios greater than 4.5, which is within the typical range for sewers.

Future Needs

In May 2010, the city was awarded a $3 million loan and an $898,000 grant from USDA's Rural Development Program. The funding paid for the improvements that comprised the 2013 plant upgrade described above. Overall, the Luna Pier sanitary sewage system serves about 1,500 users in the city plus residents in the North Shores subdivision in LaSalle Township.

Currently, Luna Pier/Erie LaSalle Township has not submitted capital improvement plans for inclusion in the TMACOG 208 Plan.

OTTAWA COUNTY FACILITY PLANNING AREAS

Last Updated, 2025

Bay Township Facility Planning Area

The Bay Township Facility Planning Area (FPA) is a designated region within the Bay Township area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Bay Township (Figure 5-9). Bay Township FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by Ottawa County which is represented by Designated Management Agencies. The responsibility of this agency is outlined below:

Designated Management Agency Responsibilities:

- **Ottawa County:** Will plan and construct facilities; and own and operate them if, and when built.

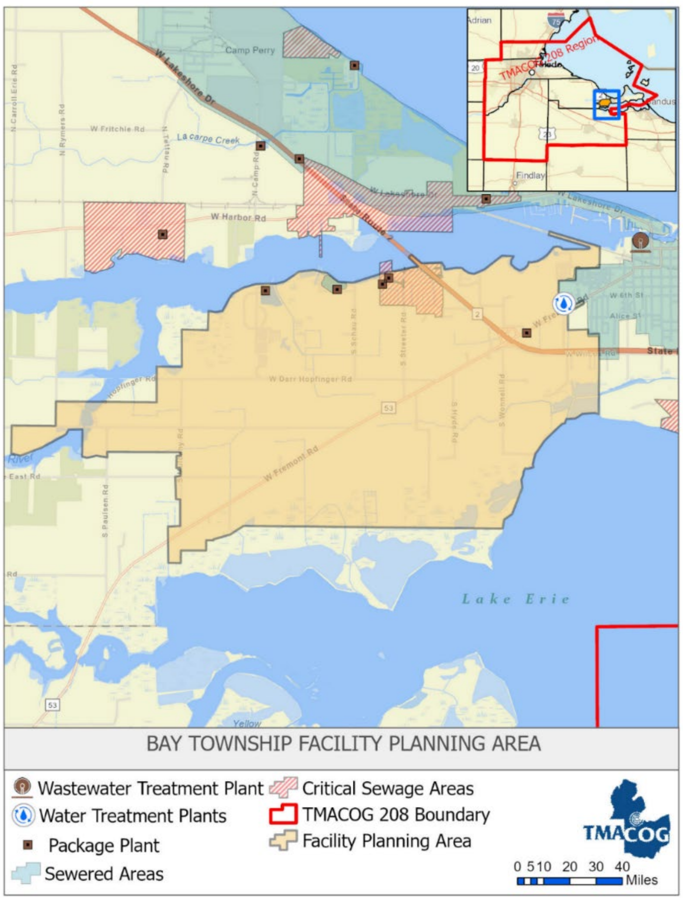


Figure 5 - 9: Bay Township Facility Planning Area

Table 5 - 25: Bay Township Area Population

Area	Population
Bay Township, entire jurisdiction *	1,142
Total	**1,142**

*only part of this jurisdiction is within the FPA boundary.
Source: U.S. Census 2020 decennial census.

Present Facilities

There are no municipal or county sewerage facilities in this area. There are several package plants located within the FPA, these are listed in Table 5-26.

Table 5 - 26: Package Plants in the Bay Township Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity (gpd)
Erie Islands Resort & Marina[A]	OT-135	Private	1989	2PS00008	110,000
Hy-Miler BP Station[A]	OT-06		1969		1,500
Johnny's Resort/Recreational Camp[A]	OT-137	Private	1990	2PR00150	12,500
Lagoon Saloon[A]	OT-147	Private*			4,200
Portage Cove MHP[A]	OT-140	Private*	1985		8,000

[A]Status is active

*Facility type is assumed

Note: Data are based on current available data as of April 2019

Issues

None presently.

Future Needs

Public sanitary sewers may be needed to eliminate existing package plants and serve areas where development occurs. Ottawa County and Bay Township are discussing future potential service area expansions.

The Ottawa County Commissioners incentivize affordable housing. Bringing water and sewer to areas near employers can aid in the Commissioner's directives. Ottawa County plans to explore the possibility of constructing a new wastewater treatment facility to serve Bay Township and Western Portage Township. Because a general plan for water in Bay Township is already complete, a Bay Township general plan for wastewater facilities is planned for 2027.

The capital improvement schedule for the Bay Township FPA is shown in Table 5-27.

Table 5 - 27: Bay Township FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2025	2026	2027	2028	2029	2030	Future
Bay Twp. Regional Wastewater Treatment Plant and Collection System	Ottawa County	$30,000,000							Plan for 2033

Catawba Island/Portage Township Facility Planning Area

The Catawba Island/Portage Township Facility Planning Area (FPA) is a designated region within the Catawba Island and Portage Township area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Catawba Island/Portage Township (Figure 5-10). Catawba Island/Portage Township FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by Ottawa County which is represented by Designated Management Agencies. The responsibility of this agency is outlined below:

Designated Management Agency Responsibilities:

- **Ottawa County**: Owns and operates the wastewater treatment plant and sanitary sewers.

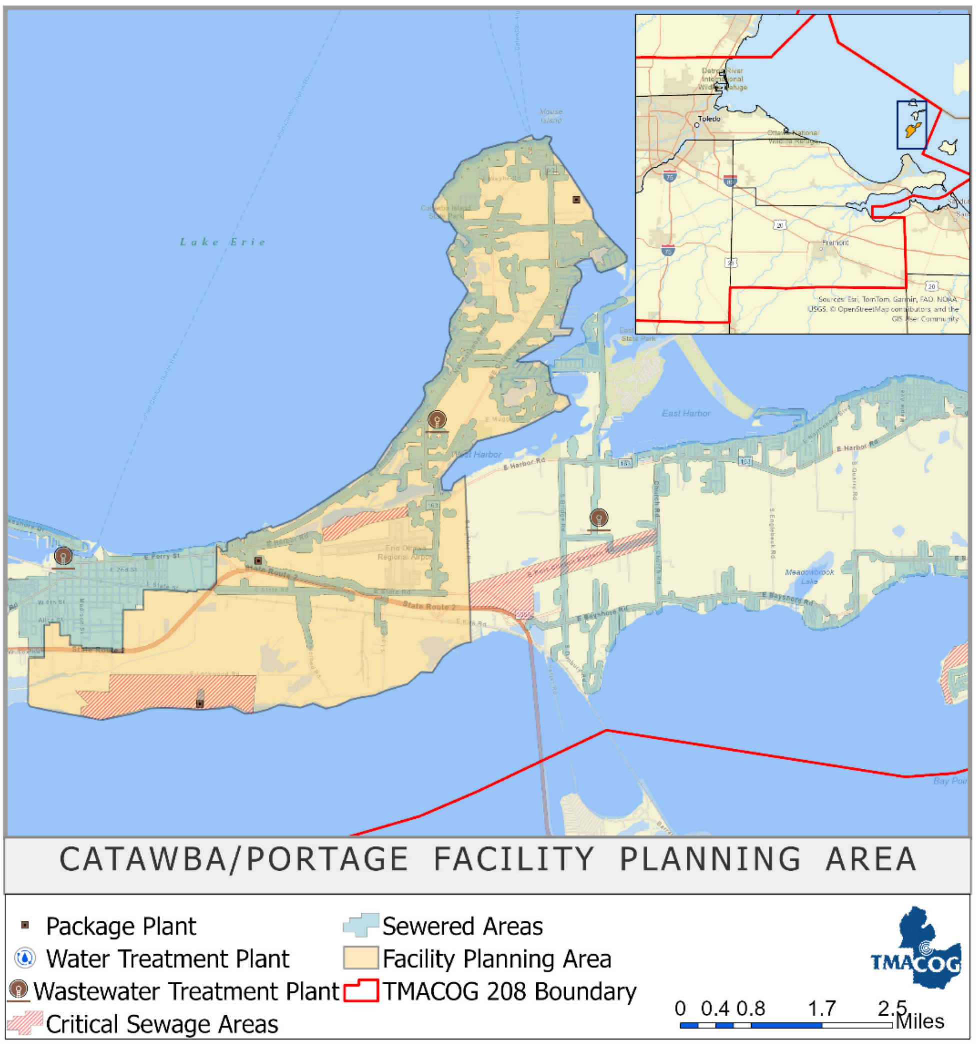


Figure 5 - 10: Catawba Island Facility Planning Area

Table 5 - 28: Catawba Island Area Population

Area	Population
Port Clinton, entire jurisdiction*	6,025
Catawba Island Township, entire jurisdiction	3,711
Portage Township, entire jurisdiction	1,558
Total	**11,294**

*only part of this jurisdiction is within the FPA boundary
Source: U. S. Census 2020 decennial census.

Present Facilities

The Catawba Island/Portage Township WWTP was built in 1991 with the region's last U.S. EPA Construction Grant. Prior to that time, the area was served by private septic systems and more than 50 package plants in Catawba Island Township alone. A 1984 survey found a third of the township's wells contaminated. This WWTP replaced the Catawba Island package plants and another 10 in Portage Township, greatly improving sewage treatment. The facility is an activated sludge plant with two batch reactor units. Because these units operate on a batch rather than continuous flow-through basis, they can accommodate widely varying flow rates. Final effluent goes through chlorination/dechlorination before discharge to Lake Erie. The plant has a summer average daily capacity of 1.34 mgd, and a winter average daily capacity of 0.68 mgd. Ohio EPA data shows an average flow of 0.3722 mgd during the period of 2013-2017.

The Catawba Island/Portage Township system is also unique in the region for its collection system. Much of Catawba Island Township has very shallow bedrock. To reduce construction costs, a pressure sewer system was installed. Individual houses tap into the sewer with grinder pumps, which are owned and operated by the County. The southern part of the system, in Portage Township, is served by conventional gravity sewers. Moore's Dock Road Sanitary Sewer Rehab/Replacement Project was completed in 2021 for $373,623. Package plants located in the FPA are listed in Table 5-29.

Table 5 - 29: Package Plants in the Catawba Island Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Bayshore Inn[A]	OT-116	Private	1987	2PR00164	8,300
Sandy Shores Mobile Home Park[A]	OT-40	Private	1984	2PR00257	12,500
Catawba Shores Mobile Home Park[A]	OT-20	Private*			

[A]Status is active

Note: Data are based on current available data as of April 2019

*Facility type is assumed

Issues

Portage and Catawba Island Townships in Ottawa County are especially popular areas for summer homes, boating, fishing, and other recreational use. These areas developed heavily without the benefit of public sewers. Failed septic systems and dozens of package plants contributed to severe problems with untreated sewage in ditches and streams. Construction of this wastewater plant eliminated many existing pollution problems and allowed further recreational development. Plant capacity is expected to be adequate for future needs.

Future Needs

- Package plants and septic systems should not be permitted in areas that may be served by public sewers.
- Sanitary sewer infrastructure projects are listed in the Capital Improvement Schedule in Table 5-30.

Table 5 - 30: Catawba Island FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2025	2026	2027	2028	2029	2030	Future
P.S. #450 (SR 53) Upgrade	Ottawa County	**$1,082,330**		2026					
PCl WWTP Sludge Removal Improvements	Ottawa County	**$3,000,000**							2033
SR 163 Sanitary Sewer Extension East of Christy Chapel Road	Ottawa County	**$1,560,787**							2033
SR 163 Sewer Ext. West of Lightner Road	Ottawa County	**TBD**							TBD
Gill Road Sanitary Sewer Extension	Ottawa County	**TBD**							TBD
PCI Grinder Pump Replacement	Ottawa County	**TBD**							TBD
		$5,643,117							

Curtice/Williston Facility Planning Area

The Curtice/Williston Facility Planning Area (FPA) is a designated region within the village of Curtice/Williston area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Curtice/Williston (Figure 5-11). The Curtice/Williston FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by Designated Management Agencies from Lucas and Ottawa Counties. The responsibilities of these agencies are outlined below:

Designated Management Agency Responsibilities:

- **Ottawa County**: Plans, owns and operates facilities in Ottawa County unincorporated areas.
- **Lucas County:** Plans, owns and operates collection system in Lucas County unincorporated areas.

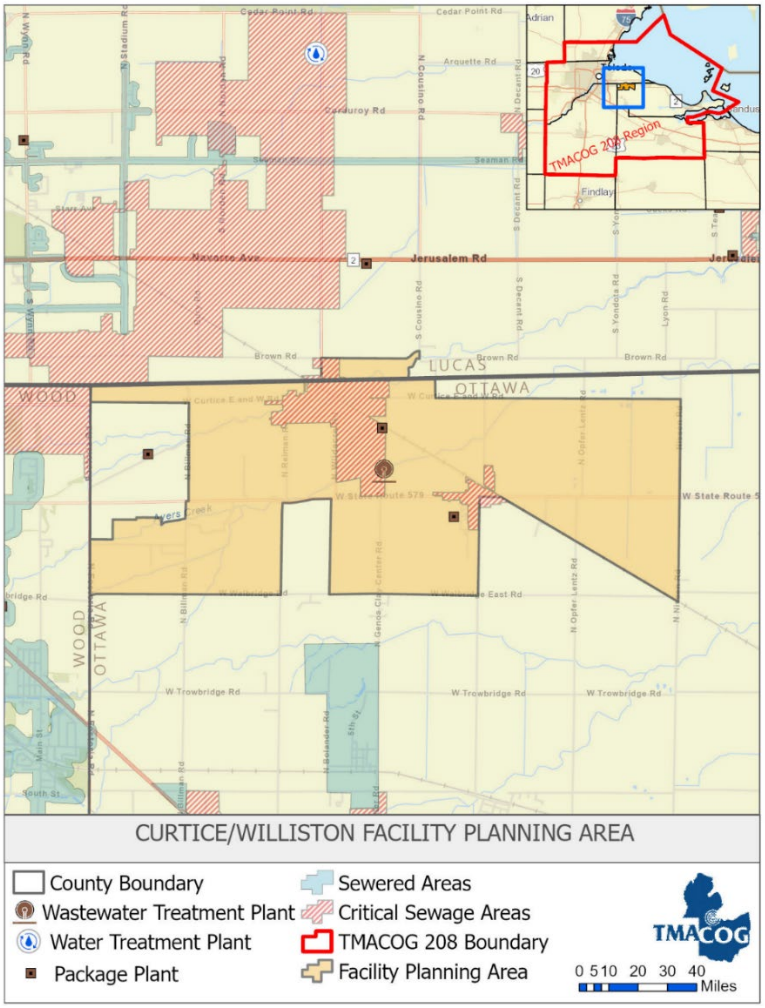


Figure 5 - 11: Curtice/Williston Facility Planning Area

Table 5 - 31: Curtice/Williston Area Population

Area	Population
Allen Township, entire jurisdiction*	2,754
Jerusalem Township, entire jurisdiction*	2,895
Total	**5,649**

*only part of this jurisdiction is within the FPA boundary.
Source U.S. Census 2020 decennial census.

Present Facilities

There are no public sewerage facilities in this Facility Planning Area. There are two package plants: a 57,000 gpd plant at Wildflower Place Subdivision in Curtice and a 32,500 gpd plant at the Luther Home of Mercy in Williston (Table 5-32).

Table 5 - 32: Package Plants in the Curtice/Williston Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Luther Home of Mercy[A]	OT-04	Private	1972, 1983	2PS00013	32,500
Wildflower Place Subdivision[A]	OT-155	Public	1999	2PW00010	57,000

[A]Status is active

Note: Data are based on current available data as of April 2019

Issues

Curtice

Curtice is an unincorporated, unsewered community in Jerusalem (Lucas County) and Allen Townships (Ottawa County). About three quarters of the town is located within Ottawa County.

In 1985, there were 145 houses in Curtice and there has been substantial new construction since that time. Six sewage bypasses to Cedar Creek were found in the village. Both the Toledo-Lucas County Health Department (TLCD) and Ottawa County Health Department have conducted sampling in the area, and found water quality violations due to high bacteria levels. Stream sampling conducted in 2015-2016 by the TLCHD, Ottawa County Health Department and the Ohio EPA documented bacterial concentrations above water quality standards at several stream sampling locations. Sewers are needed to solve the problem. In March 2016, the TLCD sent a letter to Ohio EPA in accordance with Section 6117.34 of the Ohio Revised Code to state a complaint of the unsanitary conditions present in the area.

Williston

Williston is an unincorporated community in Allen Township (Ottawa County); it is larger than either Clay Center or Rocky Ridge. Sewage is treated by home septic systems and one package plant. There is direct evidence that many septic systems have failed, in that there are obvious sewage bypasses to Crane Creek. The largest outfall is on the west side of Martin-Williston Road (Township Road 7), north of the Allen Township Cemetery. A large storm sewer discharges raw sewage and groundwater to the creek here. Ohio EPA or the Ottawa County Health Department should conduct stream and/or septic system tests to confirm the situation.

The single package plant in Williston serves the Luther Home of Mercy, and has a capacity of 32,500 gpd. In 1987, this facility served 127 residents and 300 to 350 staff. A house count at that time put a rough population estimate for Williston at 650. Approximately 90,000 gpd of treatment capacity would be needed to serve the entire town.

Being close, Williston to Curtice, Williston should be included in sewerage facility planning for Curtice - unless sampling fails to document a public health problem. Having both communities together in a sewage project improves the chances that the project will be financially feasible, in addition to solving sewage problems for both towns.

Future Needs

Ottawa County and Lucas County worked in collaboration and hired Poggemeyer Design Group (aka Kleinfelder) to develop a General Plan for the Curtice-Williston Area. The General Plan was prepared in response to the Ottawa County and Lucas County Health Departments and Ohio EPA findings of water quality degradation in Cedar Creek and Crane Creek throughout the Curtice-Williston area. In April 2019, Ottawa County and Lucas County completed a General Plan of Sewerage for the Curtice and Williston Unsewered Area. Since the Genoa WWTP did not have the capacity to provide treatment, the best option was to collect and pump to the City of Oregon WWTP for treatment.

The Curtice and Williston Unsewered Area General Plan was submitted to the Ohio EPA in April 2019 by the two Boards of County Commissioners. Since that time, Ottawa County and Lucas County officials have met with local, state and federal elected officials having jurisdiction over this area; as well as all federal and state funding program representatives assigned to the State of Ohio in an effort to develop an affordable financing plan for the project, which has since risen in cost to approximately $20 million.

The sanitary sewer project as proposed would serve 840 equivalent dwelling units (EDU's); resulting in a $23,553.56 per EDU up-front construction cost. Including Operation, Maintenance and Repair expenses, the estimated bill would be $218.00 per month per EDU. Elected, engineering and administrative officials from both Ottawa County and Lucas County have concluded that the Curtice-Williston Sanitary Sewer Project is unaffordable without substantial grant funding.

In an effort to have a good chance to secure H2Ohio grant funding, Ottawa and Lucas County were advised to prove and document how the Curtice-Williston sanitary sewer project would deliver a "Big Bang for the Buck". On October 22, 24, 28 and 30 in 2019, the Ottawa County Sanitary Engineering Department obtained and tested four E.coli samples, each day, from Cedar Creek and Crane Creek that were taken upstream and downstream of Curtice and Williston. The E.coli test results for Cedar Creek, upstream and downstream of Curtice, did not show substantial stream degradation. The E.coli test results for Crane Creek, upstream and downstream of Williston and the Wildflower Subdivision in Curtice, documented that the stream quality improved since the downstream E.coli concentration was lower than the upstream on every test performed.

Because of the in-house upstream/downstream testing results and recognizing that sufficient grant funding does not exist to affordably enable an area-wide sanitary sewer system to be constructed to serve the Curtice-Williston Area, Ottawa County and Lucas County believe that the only way to proceed is to have the Ohio EPA complete a thorough water quality modeling analysis of the two streams and, at the same time, require the Ottawa County and Lucas County Health Departments to complete a detailed sanitary survey investigation throughout the area. Once this work is completed, sufficient documentation will then exist to substantiate moving forward with the appropriate corrective action solution to remedy the documented problems; which Ottawa County and Lucas County believe (at this point) will be the replacement of on-lot sewage treatment systems that have been confirmed to fail.

A meeting was held on July 14, 2020, with the Ohio EPA, Ottawa County and Lucas County to have an in-depth discussion of the plan moving forward for the Curtice-Williston Area. Ms. Tiffani Kavalec, Chief Division of Surface Water, appreciated the position statement submitted by Ottawa and Lucas Counties. The position statement proposed a sanitary survey of Curtice and Williston to be completed by Ottawa and Lucas County Health Departments as well as request the Ohio EPA to complete a thorough water quality modeling analysis of Cedar and Crane Creeks. An estimated timeline of two years was projected to complete the sanitary surveys and water quality modeling analysis. This timeline may vary depending on any unknown circumstances related to COVID-19. Ms. Kavalec agreed to prepare a proposal to present to Ms. Laurie Stevenson, Director of the Ohio EPA, for Ms. Stevenson's approval.The Ohio EPA issued and entered the Director's Final Findings and Orders on May 25, 2021 to the Ottawa County Commissioners, Ottawa County Board of Health, Lucas County Commissioners and Lucas County Regional Board of Health for the Unincorporated Areas of Curtice and Williston. Lucas County and Ottawa County respondents shall submit a Home Sewage Sanitary Survey Plan for the Curtice/Williston Areas for Ohio EPA's review and approval. The Home Sewage Sanitary Survey Plan's goal shall be to document the type of system serving each home in the Curtice/Williston Areas and its environmental performance. The Home Sewage Sanitary Survey Plan shall be implemented within two years of the plan's approval by Ohio EPA which can be modified upon written agreement of all Parties.

A 2021 study by the U.S. Geological Survey and Ohio EPA found that Cedar and Crane Creeks near Curtice, Ohio, are significantly impaired by E. coli contamination, with human-origin fecal matter identified as the primary source. Sampling at 12 sites revealed high levels of the human-associated MST marker HF183/BacR287, detected in 97% of all samples and strongly correlated with E. coli concentrations. Notably, 91% of samples exceeded Ohio EPA's E. coli threshold. The Martin Williston Road ditch was highlighted as a significant point source of human contamination along Crane Creek, suggesting upstream inputs as well. While a canine marker (BacCan) was also detected, it overlaps with human waste, limiting its diagnostic value.

The capital improvement plan for the Curtice/Williston FPA is shown in Table 5-33.

Table 5 - 33: Curtice/Williston FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2025	2026	2027	2028	2029	2030	Future
Allen/Jerusalem Twp. Sanitary Sewer System	Lucas County and Ottawa County	$20,000,000							TBD; Dependent upon Modeling, Sanitary Survey, and Financing

Danbury Township Facility Planning Area

Danbury Facility Planning Area (FPA) is a designated region within the township of Danbury where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Danbury Township (Figure 5-12). The Danbury FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within this boundary, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by the Ottawa County which is represented by Designated Management Agencies.

Designated Management Agency Responsibilities:

- **Ottawa County**: Owns and operates the wastewater treatment plant and sanitary sewers in the unincorporated areas and the Village of Marblehead.

Figure 5 - 12: Danbury Township Facility Planning Area

Table 5 - 34: Danbury Township Area Population

Area	Total Population
Marblehead, entire jurisdiction	865
Danbury Township, entire jurisdiction	4,924
Total	**5,789**

Source: U.S. Census 2020 decennial census.

Present Facilities

The Danbury Township WWTP was built to serve the most densely developed portions of the Township. The treatment plant, expanded in 2005, has three facultative aerated lagoons designed for an average flow of 3.8 MGD and peak flow of 6.0 MGD. Ohio EPA data shows an average flow of 1.145 MGD during the period of 2018-2023. Equipment includes a tertiary Actiflo unit and alum feed to meet phosphorus limits. The effluent is chlorinated and dechlorinated before discharging to Sandusky Bay.

Issues

Danbury and Catawba Island Townships in Ottawa County are popular areas for summer homes, boating, fishing, and other recreational uses. These areas developed heavily without public sewers. Failed septic systems and dozens of package plants contributed to severe problems with untreated sewage in ditches and streams. Construction of this wastewater plant eliminated many existing pollution problems and allowed further recreational development. In the years since the construction of the treatment plant, there have been several sewer extensions, providing service to previously unsewered areas. Consequently, the flow has gradually increased.

Future Needs

- Additional sewer extensions are needed to serve areas not covered by the original construction.
- Sewer extensions to eliminate remaining problems areas and provide service to new development. New package plants and septic systems should not be permitted in areas that may be served by public sewers.
- See Table 5-36 for sanitary sewer capital improvement projects in Danbury Township.

Table 5 - 35: Danbury Township FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2025	2026	2027	2028	2029	2030	Future
Danbury Twp. WWTP Alum Feed Improvements	Ottawa County	$250,000		250,000					
Danbury Twp. WWTP Improvements	Ottawa County	$1,604,800				1,604,800			
Church Rd Sanitary Sewer Phase III	Ottawa County	$105,525							2037
SR 163 Sanitary Sewer Extension to Unsewered Areas	Ottawa County	$967,638							2036
Memorial Shoreway Sanitary Sewer Extension (Johnson's Island)	Ottawa County	TBD							TBD
Lightner Road Sanitary Sewer Extension to serve African Lion Safari	Ottawa County	TBD							TBD
Port Clinton Eastern Road Sanitary Sewer Extension (from Bayshore Rd to Church Rd)	Ottawa County	TBD							TBD
		2,927,163							

Elmore Facility Planning Area

Elmore Facility Planning Area (FPA) is a designated region within the Elmore area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Elmore (Figure 5-13). The Elmore FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within this boundary, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by the Village of Elmore which is represented by Designated Management Agencies.

Designated Management Agency Responsibilities:

- **Village of Elmore**: Owns and operates wastewater treatment facilities, and collection system within the corporate limits.

Figure 5 - 13: Elmore Facility Planning Area

Table 5-36: Elmore Area Population

Area	Population
Elmore, entire jurisdiction	1,370
Harris Township, entire jurisdiction (Ottawa County)*	2,910
Washington Township, entire jurisdiction (Sandusky County)*	2,315
Woodville Township, entire jurisdiction (Sandusky County)*	3,303
Total	**9,989**

*only part of this jurisdiction is within the FPA boundary.
Source: U.S. Census 2020 decennial census.

Present Facilities

The Elmore WWTP is an oxidation ditch plant with two clarifiers, aerobic digesters/sludge storage, and ultraviolet disinfection of final effluent. The plant's design capacity is 0.275 mgd, expecting an average daily flow of 0.180 mgd and peak daily 1.25 mgd. Liquid sludge is applied to farmland.

A new pump station was built, routing all flows to the new plant, eliminating the two SSOs. The new plant includes two independent oxidation ditches, giving the facility the ability to treat high storm flows without interfering with the normal wastewater treatment process. During a rainfall event, the oxidation ditch facility can enter a stormwater treatment mode, reducing or eliminating the need for a retention basin.

The Elmore sewer system was formerly combined sanitary and storm. In 1991, work began to separate the system and was completed in 2000 at a total cost of $900,000, all constructed with local funds. In 2009, Elmore completed a Sanitary Sewer Interceptor Replacement and a new Trunk Sanitary Sewer Main project at a cost of $1.1 million, funded largely with Ohio Public Works Commission (OPWC) loans and local funds. The new WWTP was completed in 2013 at a cost of $5.5 million, with financing from the OPWC and the Ohio Water Pollution Control Loan Fund.

Issues

The new wastewater plant is expected to provide adequate treatment capacity, including flows that previously discharged through sanitary sewer overflows. Some sources of I/I have been eliminated, but extraneous flows into the sanitary sewers continue to be a problem. The new plant is designed with peak capacity to treat the wet weather flows.

Future Needs

With completion of sewer separation and a new wastewater treatment plant, Elmore's sewer system will meet the community's needs.

The current NPDES permit indicates:

- The Village of Elmore shall complete an Infiltration and Inflow (I&I) Study and Elimination Program.
- The plan shall be submitted to Ohio EPA not later than 18 months from the effective date of the permit.
- Summary reports shall be submitted not later than March 1 of each year.
- The I&I Study and Elimination Program shall be completed by no later than the expiration of the

permit.

During the time of this review (August 2025), Elmore was in the process of an I&I investigation; as part of this process, they smoke tested about 40% of the Village's storm sewers and shall be contracting to have these sewers televised. The Village was in the planning stages of completing the smoke testing and working with the contractor for the televising portion.

The capital improvement plan for the Elmore FPA is shown in Table 5-37.

Table 5 - 37: Elmore FPA Capital Improvement Schedule

Project	DMA	Total Cost ($)	Annual Capital Improvement Needs ($)						
			2025	2026	2027	2028	2029	2030	Future
I & I plan rehabilitation of sewers lines		237,190					237,190		

Genoa Facility Planning Area

The Genoa Facility Planning Area (FPA) is a designated region within the village of Genoa area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Genoa (Figure 5-14). The Genoa FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by Designated Management Agencies from the village of Genoa and Ottawa County. The responsibilities of these agencies are outlined below:

Designated Management Agency Responsibilities:

- **Village of Genoa**: Owns and operates wastewater treatment facilities, and collection system within the corporate limits.
- **Ottawa County:** Owns and operates collection system in Ottawa County unincorporated areas, and the Village of Clay Center, connecting to Village system for treatment services. Genoa maintains sewers under contract with Ottawa County.

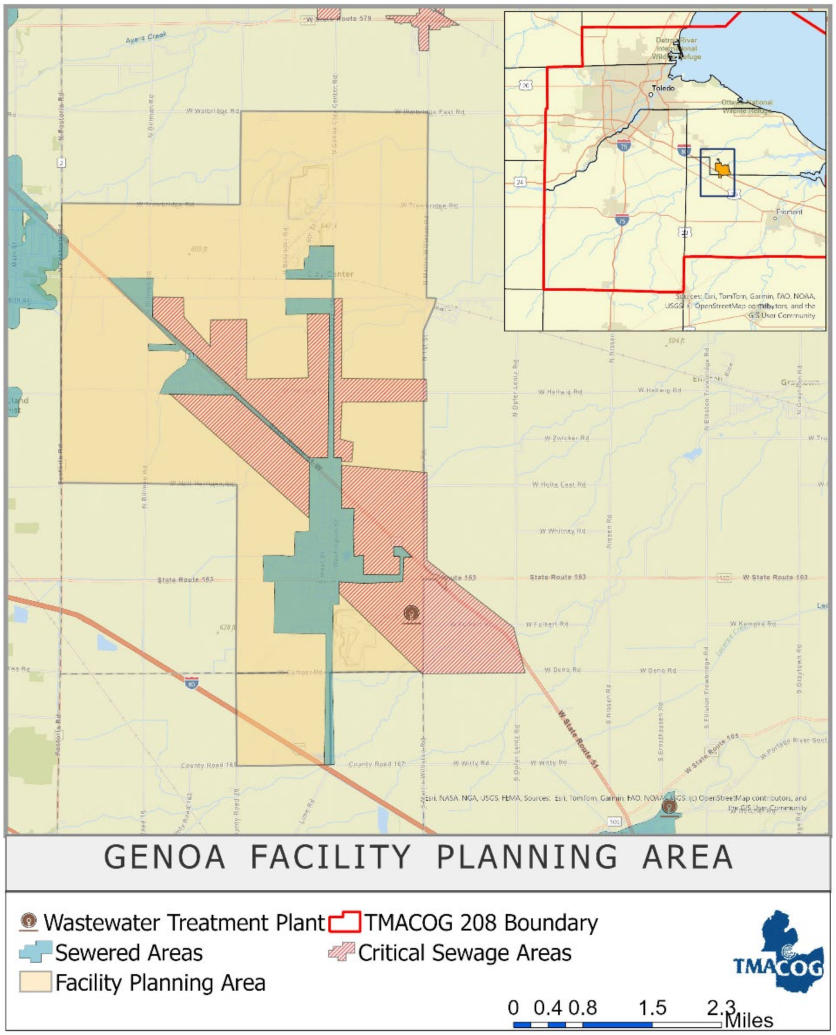


Figure 5 - 14: Genoa Facility Planning Area

Table 5 - 38: Genoa Area Population

Area	Total Population
Genoa, entire jurisdiction	2,232
Clay Center, entire jurisdiction	262
Allen Township, entire jurisdiction*	3,773
Clay Township, entire jurisdiction*	4,825
Woodville Township, entire jurisdiction*	3,303
Total	**14,395**

*only part of this jurisdiction is within the FPA boundary.
Source: U.S. Census 2020 decennial census

Present Facilities

Genoa has a lagoon treatment system with a design flow of 0.60 mgd. Ohio EPA data shows an average flow of 0.401 mgd, and a peak flow of 0.610 mgd during the period of 2004-2009. There are several package plants in the area; several others have been eliminated by tapping into the Genoa system in recent years, including Woodland Estates, the rest areas at the Ohio Turnpike Rest Areas in Woodville Township located 1.5 miles south of Genoa, Genoa High School, and Guardian Industries.

Genoa completed separation of its sanitary sewer system and elimination of all combined sewer overflows in 2001.

Package plants located in the FPA are listed in Table 5-39. The Greenwood permit calls for the plant to tap into the Genoa system within 60 months (2016).

Table 5 - 39: Package Plants in the Genoa Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Blue Moon Apartments[A]	OT-133	Private	1991	2PW00019	2,000
Ernesto's Restaurant[A]	OT-47	Private	1964,2000	2PR00153	3,000

[A]Status is active

Note: Data are based on current available data as of April 2019

Issues

The Toussaint River TMDL study included sampling at three locations near the Village of Genoa. The results of the sampled data from three sites are as follow:

- **River Mile (RM) 20.20 – Camper Road (upstream of Genoa WWTP):**
  Fecal coliform bacteria levels exceeded the Primary Contact Recreation (PCR) criterion on two occasions. Genoa's sanitary sewer system does not extend south to this location; therefore, the most likely source of contamination is attributed to poorly treated sewage from failing on-lot septic systems.
- **RM 19.65 – Adjacent to Fulkert Road (downstream of Genoa WWTP):**
  Increased concentrations of nitrate+nitrite and phosphorus are observed downstream from the Genoa WWTP. One exceedance of the PCR criterion for fecal coliform bacteria is recorded. Median phosphorus concentrations remain below the target value.
- **RM 18.40 – Fulkert Road (further downstream):**
  Data show continued exceedances for fecal coliform bacteria and elevated levels of strontium and total dissolved solids.

At a downstream location, Martin Wilson Road (RM 11.30), nitrate+nitrite concentrations decrease compared to upstream levels at RM 14.73, yet still remain above the target threshold. Median phosphorus values approach the target of 0.1 µg/L.

The attainment status reported in the TMDL classifies RM 20.2 and 19.65 as in "full attainment" of water quality standards, while RM 18.4 is assessed as "partial attainment" due to sedimentation. Sources of impairment at RM 18.4 include row crop agriculture and quarry activity. Exceedances for fecal coliform bacteria and strontium are documented at all three Genoa-area sites, with total dissolved solids additionally exceeding limits at RM 18.4.

Clay Township

High bacteria levels in streams due to failed septic systems have long been documented. The areas of concern are in Clay Township Section 20. Providing sanitary sewers to these areas would significantly improve South Branch Turtle Creek. The health concerns indicated by the County Health Department would also improve dramatically. In response to these issues, a building ban was imposed several years ago. Ottawa County, the Village of Genoa, and the Village of Clay Center developed plans for expansion of the Genoa WWTP costing $500,000, and a phased extension of sanitary sewers. Several phases have been built; sewers for the Village of Clay Center and along Genoa-Clay Center Road were completed in 2004.

Future Needs

- Continue and complete Allen/Clay Township sewers (Phase V). Phase VI (areas adjacent to the Village of Genoa) both depend on financing.
- Implementation of the Toussaint River Basin TMDL calls for reducing phosphorus loadings to this watershed. In 2015, Ohio EPA set a deadline for a General Plan to meet 1.0 mg/l monthly average effluent phosphorus. The capital improvement plan supports state and federal financial assistance to implement the facilities needed.
- The village is currently studying expansion scenarios for their WWTP. This study will show that the WWTP could be feasibly expanded to 3.5 MGD. An expansion, expected to be to 1.0 MGD, is expected to start with the installation of a new aeration system in 2027. Cost estimates are expected by the end of 2025.

The capital improvement plan for the Genoa FPA is shown in Table 5-40.

Table 5 - 40: Genoa FPA Capital Improvements Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2025	2026	2027	2028	2029	2030	Future
Allen / Clay Twp. Sanitary Sewer Extension, Phase 5	Ottawa County	$2,388,750							2035
Allen / Clay Twp. Sanitary Sewer Extension, Phase 6	Ottawa County	$2,754,640							2040
		$5,143,390							

Locust Point Facility Planning Area

Locust Point Township Facility Planning Area (FPA) is a designated region within the village of Locust Point where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Locust Point (Figure 5-15). The Locust Point FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by Designated Management Agencies from Carroll Township Regional Water and Sewer District. The responsibilities of these agencies are outlined below:

Designated Management Agency Responsibilities:

- **Carroll Township Regional Water and Sewer District**: Responsible for planning sewerage facilities, and will own and operate a system, if and when built.

Figure 5 - 15: Locust Point Facility Planning Area

Table 5 - 41: Locust Point Area Population

Area	Population
Carroll Township, entire jurisdiction	2,117
Total	**2,117**

Source U.S. Census 2020 decennial census.

Present Facilities

The Locust Point area includes numerous marinas, mobile home parks, summer and permanent residences, and the Davis Besse nuclear power plant. There are several package plants in this area (Table 5-42), and several marinas that use honey tanks. Like in Danbury and Catawba Townships, growth in the recreational industry has applied pressure for adequate sewage treatment to accommodate the growth.

Table 5 - 42: Package Plants in the Locust Point Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Fenwick Marina[A]	OT-156	Public		2PR00130	15,000
First Energy Davis Besse Nuclear Power Plant[A]	OT-10A	Private	1974	2IB00011	15,000
First Energy Davis Besse Nuclear Power Plant[A]	OT-10B	Private	1974	2IB00011	23,000
Green Cove Condominiums[A]	OT-117	Private	1987	2PS00007	77,000
Inland Mobile Home Park/Magee East Marina[A]	OT-12	Private		2PY00074	35,000
Magee Marsh Nature Center[A]	OT-13	Private*	1971		6,000
Turtle Creek Marina & Campground[A]	OT-160	Private	2006	2PS00011	20,000

[A]Status is active

*Facility type is assumed

Note: Data are based on current available data as of April 2019

Issues

Although less heavily developed than Danbury or Catawba Island Townships, the situation is similar: pressure for lakefront recreational development has preceded the availability of sanitary sewers. Ohio EPA notes septic sewage issues in storm sewers in beach-front housing areas. It would be better for the existing package plants in these areas to tap into a join system to solve this problem.

The density of development, especially along the lake front where many houses are on small lots, calls for a public sewer system. Additional development will only make the problem worse, and the need greater.

Ohio EPA conducted a Total Maximum Daily Load (TMDL) study of the Toussaint River in 2003, which includes part of this FPA.

Future Needs

A General Plan or facilities study will be needed to determine how best to serve this area. There are no projects planned for the Locust Point FPA at the present.

Middle Bass Facility Planning Area

Middle Bass Facility Planning Area (FPA) is a designated region within the village of Middle Bass where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by wastewater treatment facilities in the village of Middle Bass (Figure 5-16). The Middle Bass FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by Designated Management Agencies from Ottawa County. The responsibilities of these agencies are outlined below:

Designated Management Agency Responsibilities:

- **Ottawa County:** Will own and operate sewerage system, if and when built.

Figure 5 - 16: Middle Bass Facility Planning Area

Table 5 - 43: Middle Bass Area Population

Area	Population
Put-in-Bay Township, entire jurisdiction*	813
Total	**813**

*Only part of this jurisdiction is within the FPA boundary.
Source: U.S. Census 2020 decennial census.

Present Facilities

There are no public wastewater treatment facilities in this FPA.

Package plants in the FPA are listed in Table 5-44.

Table 5 - 44: Package Plants in the Middle Bass Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
East Point Villas[A]	OT-158	Private	2005	2PW00017	4,000
Lake Erie Utilities Co.[A]	OT-128	Private	1988	2PR00057	62,000
Middle Bass Club[A]	OT-92	Private	1980	2PW00020	5,000
St. Hazard[A]	OT-148	Private		2PR00117	35,000
Walleye's, J.F. Restaurant[A]	OT-152	Private	1997	2PR00125	15,000

[A]Status is active

Note: Data are based on current available data as of April 2019

Issues

Like South Bass Island, sewage treatment needs for Middle Bass are driven much more by peak recreational use during the summer than by year-round residents. As part of redeveloping the Lonz Winery property, the Lonz and Burgundy Bay Subdivision package plants were eliminated. The new Lake Erie Utilities plant serves Burgundy Bay and the Ohio Department of Natural Resources (ODNR) park.

In the long-term, the need for a central sewerage system for the island will increase. Development has continued, and individual systems are an increasing problem. Of note is beach front housing on small lots, notably on the island's north panhandle.

Future Needs

- The Township and County should evaluate long-term options to meet wastewater treatment needs. A facilities study should be prepared to evaluate need, feasibility, and financing. Options may include:
    - A single wastewater plant serving the entire island.
    - A single wastewater plant serving all Middle Bass Island and all or part of South Bass Island.
    - Provide wastewater treatment service for all Middle Bass Island and all or part of South Bass Island by connecting to the Catawba Island/Portage Township WWTP.

There are no projects planned for the Middle Bass FPA at present.

Oak Harbor Facility Planning Area

Oak Harbor Facility Planning Area (FPA) is a designated region within the village of Oak Harbor where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Oak Harbor (Figure 5-17). The FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by Designated Management Agencies from the village of Oak Harbor and Ottawa County. The responsibilities of these agencies are outlined below:

Designated Management Agency Responsibilities:

- **Village of Oak Harbor**: Owns and operates the wastewater treatment facility and collection system within the corporate limits, and operates the collection system in unincorporated areas, connecting to the village system.
- **Ottawa County:** Owns the collection system in Ottawa County unincorporated areas, connecting to the village system for treatment services.

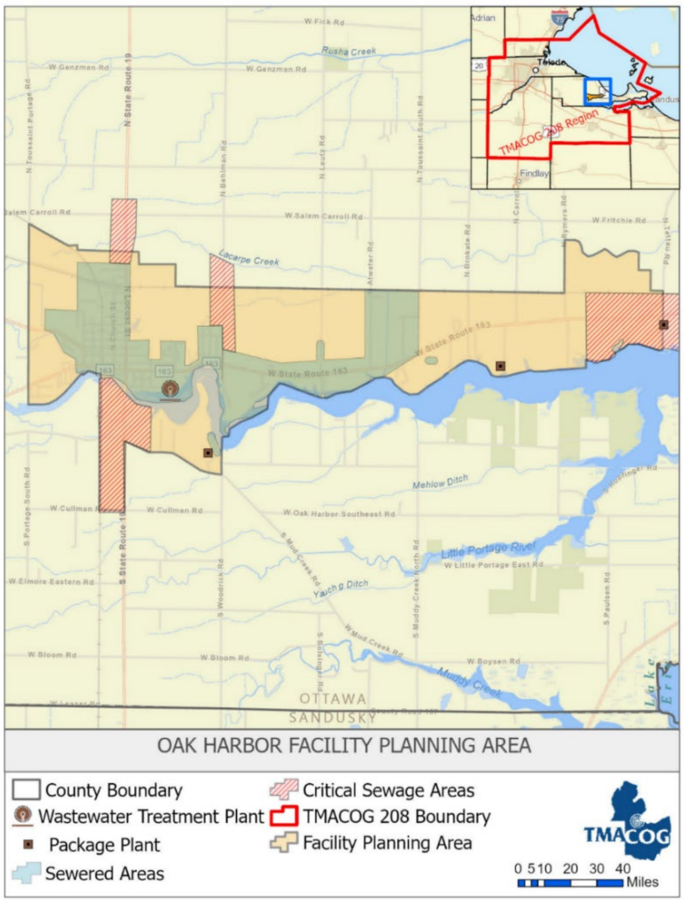


Figure 5 - 17: Oak Harbor Facility Planning Area

Table 5 - 45: Oak Harbor Area Population

Area	Population
Oak Harbor, entire jurisdiction	2,821
Salem Township, entire jurisdiction*	5,311
Total	**8,132**

*only part of this jurisdiction is within the FPA boundary.

Source: U.S. Census 2020 decennial census

Present Facilities

The Oak Harbor WWTP is a trickling filter plant with an average flow capacity of 0.930 mgd. Ohio EPA data shows an average flow of 0.678 mgd and a peak flow of 7.333 mgd during the period of 2004-2009. The treatment processes include primary settling, pre-aeration, trickling filters, final settling, and ultra-violet disinfection. The peak capacity while meeting effluent standards is 2.16 mgd. The peak hydraulic capacity is 4.33 mgd at which rate 2.16 mgd receives complete treatment, and the additional 2.17 mgd receives primary treatment and disinfection. Sludge handling facilities have been upgraded. The new facilities were completed in 2000 at a cost of $1,003,563, and include aerobic digestion and a belt filter press. Class B Sludge may be applied to farmland, disposed of in a solid waste landfill, or taken to another municipal wastewater treatment plant, commonly referred to as Publicly Owned Treatment Works (POTW).

In 1990, Oak Harbor completed major storm sewer improvements, to separate storm runoff from the sanitary sewer system. Four major storm sewers were built: (1) Locust Street, from Main to the Portage River; (2) Finke Street, its entire length to the river; (3) Toussaint Street from Walnut to the river; and (4) Locust from North Railroad Street to Lacarpe Creek. The project cost was $1.276 million, locally funded. These improvements should substantially reduce Oak Harbor's I/I problems and reduce bypassing.

- The collections system currently has seven permitted overflow points. An updated LTCP was approved by OEPA in 2018. The 2018 LTCP includes constructing a new storm sewer and sanitary sewer in the Church Street corridor from S. Railroad Street to the Portage River, installing a CSO Basin Overflow at the 5MG retention basin, installing a storm sewer at the intersection of State Route 19 and Main Street, installing a storm sewer on Oak Street and potentially closing CSO’s 8 and 10, in addition to the previously closed CSO’s 2, 4, and 7. These new facilities were completed in June 2021 at the cost of $9.2 million. Funding was provided by local funds and the USDS in the form of grants and loans.
- Park Street from State Route 19 to Church Street was totally reconstructed including a new storm sewer directed to the Church Street Storm at a cost of $400,000. This was completed in July 2021. This project was funded by local funds and the Ohio Public Works Commission.
- Oak Harbor completed a Long-Term Control Plan (LTCP) that was approved by Ohio EPA in 2004. The plan includes a collection and treatment solution, with an intercepting sewer between the present combined sewer overflows (CSOs) and the river and a 5.0 million gallon CSO retention basin. Other improvements include screening and pumping facilities for the CSO retention basin. The new facilities and repairs were completed in 2013 at a cost of $7.62 million.

Package plants located in the FPA are listed in Table 5-46.

Table 5 - 46: Package Plants in the Oak Harbor Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Chet's Place Campground[A]	OT-159	Public	2006	2PR00234	3,500
Portage Pointe Condos/Oak Harbor Golf Course[A]	OT-115	Public	1986	2PR00127	12,000

[A]Status is active

Note: Data are based on current available data as of April 2019

Future Needs

- Additional sewer separation projects will be built if required to reduce extraneous stormwater entering the system and reduce CSO events.
- Sewer extensions to eliminate remaining problem areas and provide service to new development. New package plants and septic systems should not be permitted in areas that may be served by public sewers. Several areas have been identified as needing service:
    - South of the Portage River, Ohio EPA testing identified septic sewage in a ditch crossing SR 19.
    - Tap residences along SR 19 north of the Village into the sewer system, up to Salem-Carroll Road.

The capital improvement plan for the Oak Harbor FPA is shown in Table 5-47.

Table 5 - 47: Oak Harbor FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2025	2026	2027	2028	2029	2030	Future
Salem Twp. – Behlman Rd Sewer Extension	Ottawa County	$4,000,050							2036

Port Clinton Facility Planning Area

Port Clinton Facility Planning Area (FPA) is a designated region within the city of Port Clinton where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Port Clinton (Figure 5-18). The Port Clinton FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by Designated Management Agencies from the city of Port Clinton and Ottawa County. The responsibilities of these agencies are outlined below:

Designated Management Agency Responsibilities:

- The **City of Port Clinton**: Owns and operates wastewater treatment facilities, and the collection system within the corporate limits.
- **Ottawa County:** Owns the collection system in unincorporated areas, except as agreed between Ottawa County and the City of Port Clinton. Additionally, Ottawa County operates the collection system in unincorporated areas, except as agreed upon between Ottawa County and the City of Port Clinton. All sewers in the planning area connect to the Port Clinton system for treatment services under contract.

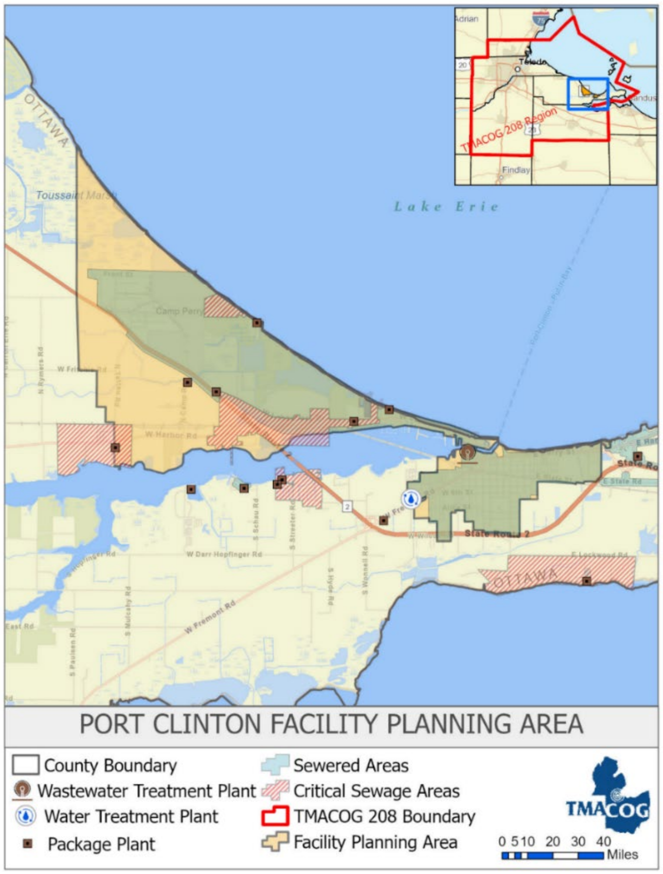


Figure 5 - 18: Port Clinton Facility Planning Area

Table 5 - 48: Port Clinton Area Population

Area	Population
Port Clinton	6, 025
Bay Township, entire jurisdiction*	1,142
Erie Township, entire jurisdiction*	1,147
Total	**8,314**

*only part of this jurisdiction is within the FPA boundary.

Source: U.S. Census 2020 decennial census

Present Facilities

Port Clinton has an activated sludge plant which experiences heavy I/I flows. The treatment plant began Port Clinton has an activated sludge plant which experiences heavy I/I flows. The treatment plant began expansion with the completion of Phase I in 2004. Phase I included new primary treatment, chlorination, and the Actiflo system. The design average daily flow rate is 2.0 mgd; the plant has a peak daily design for secondary treatment of 4.0 mgd, and a peak daily flow rate of 24.0 mgd for their Actiflo system. The City of Port Clinton's Wastewater Treatment Plant has an average daily flow of approximately 2.699 MGD. This translates to an estimated annual treatment volume of around 985 million gallons. The Port Clinton system experiences heavy I/I flows; the purpose of the Actiflo system is to enable the plant to treat as much storm flow as possible up to 24.0 mgd and meet permit requirements under high flow conditions. The extraneous water results in overflows from the system's combined sewer overflow (CSO) into the Portage River. Duckbill valves which stopped the inflow from high lake levels were installed on the CSOs in the late 1990s, decreasing peak flows by about 1.0 mgd. The amount of inflow the system receives is influenced by the lake level. Dechlorination facilities were added to the plant in 1995.

The wastewater plant underwent an extensive upgrade and capacity expansion to treat wet weather capacity.

- The first phase (Phase IA) included new headworks, modified the influent coarse screening, replaced influent fine screening, and modified the chlorine contact chamber. An Actiflo system capable of handling 24.0 total mgd was also installed: a compact device that includes screening, flocculation, settling, and disinfection. The normal daily flow is sent directly to secondary treatment while the Actiflo system is used for' during wet weather flows.

  The second phase expanded the biological treatment, final clarifiers, and sludge handling. The upgraded plant produces Class B sludge, dewatered by sludge press, and was completed in 2009.

Since 1999, Port Clinton has received a series of state and federal grants, including federal line-items of $1.4 million in 1999, $485,000 in 2001, and $630,000 and $607,433 in 2003. In addition, Port Clinton secured an Ohio Public Works Commission (OPWC) grants/loans, State and Tribal Assistance Grant (STAG) funding of $257,957. In all, Port Clinton raised $3.7 million in federal and state grants from 1999-2003. In 2006, Port Clinton applied for $3.266 million in financing from the Ohio Water Pollution Control (OWPC) Loan Fund for Phase II improvements. In 2008, a $2.79 million low-interest loan was approved by the Ohio EPA Water Pollution Control Loan Fund for the second phase of Port Clinton's Long-Term Control Plan to increase plant capacity. These projects have all been completed.

There are several package sewage treatment plants located in the Port Clinton FPA; they are listed in Table 5-49.

Table 5 - 49: Package Plants in the Port Clinton Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Perry House[A]	OT-67	Private*	1969		2,500
Portage View Mobile Home Park[A]	OT-68	Private	1985	2PY00056	12,500
Sunset Inn[I]	OT-69	Private*	1974		9,000
White Caps Campground[A]	OT-144	Private*	1988		6,000
Willow Beach Trailer Park[A]	OT-73	Private	1964	2PY00085	9,000
Wagon Wheel[I]	OT-71	Private	1960	2PY00084	12,500

[A]Status is active; [I]Status is inactive
*Facility type is assumed
Note: Data are based on current available data as of April 2019

Issues

Combined Sewer Overflows

Port Clinton's combined sewer overflows have been addressed per the Consent Decree with U.S. EPA. All but one CSO has been eliminated, by utilizing the Actiflo system, stopping lake inflow to remaining CSO, and current sewer separation projects

The city is under a consent decree with U.S. EPA for its CSOs. In 2000, Port Clinton eliminated three CSOs, is not accepting new sewer taps in the combined sewer area and installed flap valves on all remaining regulators. In 2003, the pump stations were upgraded, with new pumps and controls, greater capacity, at a cost of $700,000. In 2004, the Jackson Street CSO regulator was eliminated, leaving the Port Clinton system with one CSO point (Adams Street). In 2012, telemetering was added to the Adams Street CSO.

Package Plants and Onsite Sewage Systems

In 2009, the force main connecting Camp Perry with the Port Clinton sewerage system was completed. For reasons of environmental protection, public health, and financial viability of sewer system improvements, it is necessary that existing package plants and onsite systems be eliminated, and restrictions be placed on new onsite systems. The following restrictions apply to §§ 21, 22, 26, 27, 28, 33, 34, 35, and 36 of Erie Township in this FPA when Ottawa County and Port Clinton deem the force main connecting Camp Perry with Port Clinton available for local service connections along its route:

- No new package plants shall be permitted; connection to the Port Clinton sewerage system shall be required.
- No replacement package plants shall be permitted; connection to the Port Clinton sewerage system shall be required.
- No upgraded package plants shall be permitted; connection to the Port Clinton sewerage system shall be required. Repairs to maintain proper operation are allowed when they do not change the design capacity of the package plant or make a fundamental design change required to comply with effluent standards.
- No new onsite sewage treatment systems shall be permitted:
    - Except for property where no sanitary sewer connecting to the Port Clinton sewerage system is Available and Accessible (see **Chapter 5**), and provided the on-site system produces no off-lot discharge;
    - In all other cases, connection to the Port Clinton sewerage system shall be required.
- Existing on-site sewage disposal or treatment systems may not be replaced, repaired, or upgraded where a sanitary sewer connecting to the Port Clinton sewerage system is Available and Accessible.
- Existing on-site sewage disposal or treatment systems may be replaced, repaired, or upgraded, but only where the complete system is on-lot, and it produces no off-lot discharge, and where no sanitary sewer connecting to the Port Clinton sewerage system is Available and accessible.

Future Needs

- Ottawa County and the City of Port Clinton wastewater treatment services agreement for a portion of Erie Township, including Camp Perry, the Erie Industrial Park, and the BFI landfill. The first areas served were Camp Perry and Fenner Dunlop, completed in 2009. A sewer to collect the BFI landfill's leachate is planned at an estimated cost of $860,345.
- With the expansion and upgrade of the WWTP completed, the plant will handle wet weather flow substantially better than the old system. Port Clinton will continue to separate sewers as feasible.

- In February 2018, Ottawa County entered into a contract with Underground Utilities to install sewers in the Ascher Beach Area at the east end of the Erie Township: SR 163 and Richey Road Critical Sewage Area. The project, an assessment initiative, was completed in August 2018 and resulted in the elimination of three package plants: Spinnaker Bay, Wagon Wheel, and Transmissions Unlimited. The eastern boundary of the critical sewage area is now defined as the western boundary of Spinnaker Bay Condominium (north side of SR 163) and the western boundary of Transmissions Unlimited (south side of SR 163). Following consultation with the City of Port Clinton, it was determined that all parcels within the Richey Road portion of this Critical Sewage Area (16C-OT), with one exception, are now connected to the existing sewer collection system. The only unconnected parcel is the former Jackknife Marina at the end of Richey Road, which lies outside city limits and is currently inactive as a marina. The property contains one single-family dwelling with a holding tank, and the owner has expressed interest in connecting to the sewer system in the future. Since the parcel is located outside city limits but within the City of Port Clinton's 208 FPA, any future development plans will prompt consultation with the City to explore connection options. Ottawa County recommends renaming this area from "Erie Twp: SR 163 and Richey Road" to **"Erie Twp: SR 163 and Lakeshore Drive"** to more accurately reflect the updated service area boundaries.

The capital improvement plan for the Port Clinton FPA is shown in Table 5-50.

Table 5 - 50: Port Clinton FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2025	2026	2027	2028	2029	2030	Future
Erie Twp. Sanitary Sewer Extension	Ottawa County	$3,847,156							2034

Put-In-Bay Facility Planning Area

The Put-in-Bay Facility Planning Area (FPA) is a designated region within the village of Put-in-Bay where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Put-in-Bay (Figure 5-19). The Put-in-Bay FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by Designated Management Agencies from the Village of Put-in-Bay and Ottawa County. The responsibilities of these agencies are outlined below:

Designated Management Agency Responsibilities:

- **Village of Put-in-Bay**: Owns and operates wastewater treatment facilities, and the collection system within the corporate limits. Sets standards for collection system in unincorporated area, which the Village will own and operate after construction.
- **Ottawa County:** Plans and may construct the collection system in unincorporated areas, connecting

to Village system for treatment services.

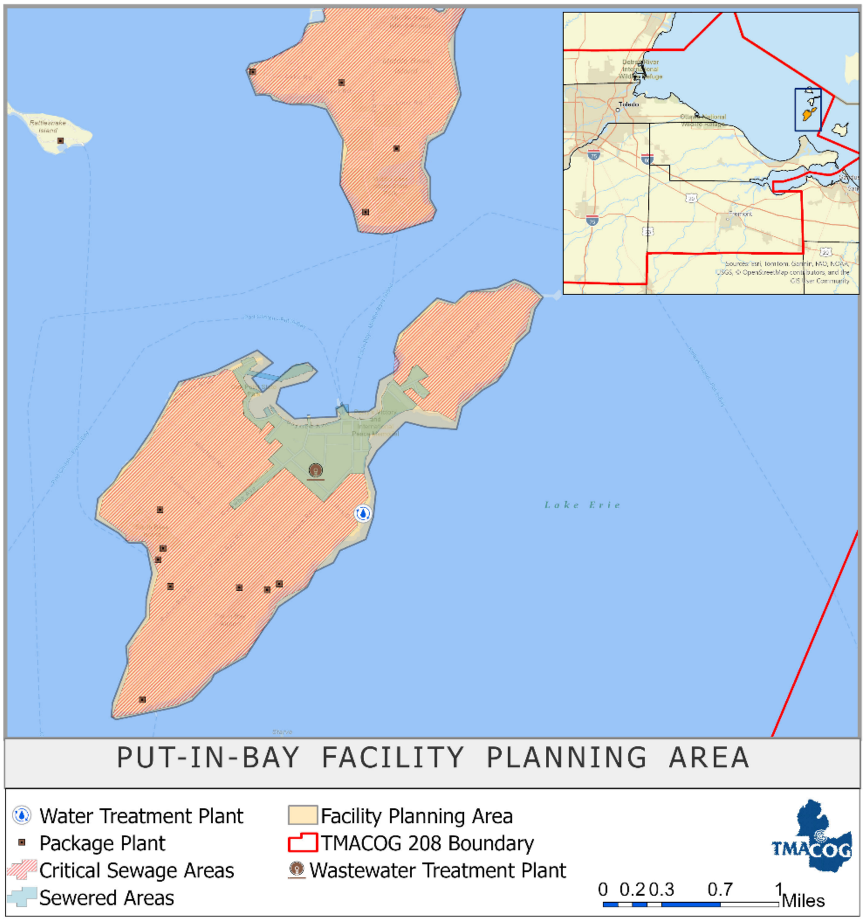


Figure 5 - 19: Put-in-Bay Facility Planning Area

Table 5 - 51: Put-in-Bay Area Population

Area	Population
Put-in-Bay, entire jurisdiction	154
Put-in-Bay Township, entire jurisdiction*	813
Total	**967**

*only part of this jurisdiction is within the FPA boundary.
Source: U.S. Census 2020 decennial census.

Present Facilities

The Put-in-Bay wastewater plant was built in the early 1980s, originally to serve the central downtown area of the Village, eliminating package plants and individual septic systems. Like other coastal areas in Ottawa County, the served population on a summer weekend is far greater than the permanent residents. While there are only 128 year-round residents in the Village, there are often 10,000 persons in town during the spring and summer. The treatment plant is a sequencing batch reactor (SBR) activated sludge facility with a design capacity of 500,000 gpd in three SBR units with fine bubble diffusers, ultraviolet disinfection, sludge dewatering and storage, and standby power generator. The plant was expanded in 2010 with the third SBR unit costing $890,000 from the Corps of Engineers, $650,000 from the Ohio Public Works Commission (OPWC), up to $1.3 million from American Recovery and

Reinvestment Act (ARRA), and a low interest loan from Ohio Water Development Authority (OWDA).

In 2004, the summer average daily flow was 0.1 mgd, and the peak daily was 0.31 mgd. The winter average daily flow was 0.03 mgd and the peak daily was 0.28 mgd. The WWTP was originally designed based on a waste stream of 300 mg/L BOD_5. As the service area has expanded, the influent strength has regularly approached 200 mg/L BOD_5.

Before the installation of the current treatment plant, the Village used a 0.12 mgd extended aeration plant. This plant is still used as an aerobic digester during summer months when the system experiences its peak organic loadings.

There are several package plants in the unincorporated areas of South Bass Island (Table 5-52).

Table 5 - 52: Package Plants in the Put-in-Bay Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Bird's Nest[A]	OT-86	Private	1982	2PR00208	7,000
Fox's Den Campground[A]	OT-90	Private	1980	2PR00207	5,000
Island Club MHP[A]	OT-136	Private	1988	2PR00074	29,000
Miller Boat Lines[A]	OT-153	Private		2PR00154	5,000
Put-in-Bay Condos[A]	OT-142	Private	1987	2PR00222	10,600
Saunder's Resort South[A]	OT-93	Private	1983	2PR00133	4,500
South Bass Island State Park[A]	OT-95	Public	1992	2PP00045	20,000
Victory Park Resort[A]	OT-97	Private*	1958	No discharge	1,500

[A]Status is active
*Facility type is assumed
Note: Data are based on current available data as of April 2019

Issues

The existing system should be expanded to serve the entire Village. Most of the Village is presently served; the remaining areas should be connected. A public sewerage system is needed to serve as much of the developed part of South Bass Island as possible. Conventional extended aeration package plants are poorly suited to handle widely varying flow rates. When small treatment plants receive surge flows, they provide little wastewater treatment.

The Ottawa County Health Department is concerned with the potential for failed septic systems on South Bass Island. The Health Department determines the adequacy of septic systems whenever there is an application for a building or development permit, and during mortgage inspections. In addition, all permits currently issued for new or replacement septic systems include a requirement for annual inspections of the septic system and an operational and maintenance permit for the life of the septic system. Whenever the Health Department finds evidence of a failed or failing septic system it requires the owner to replace the septic system.

The village is working with Ohio EPA to create a phosphorous reduction plan. This is currently in the planning stage and will be updated once next steps are determined.

Package Plants and Onsite Sewage Systems

Ohio EPA, Ottawa County Commissioners, Ottawa County Health Department, and the Put-in-Bay

Township Trustees negotiated Findings & Orders that impose a Special Connection Ban on South Bass Island. For reasons of environmental protection, public health, and financial viability of sewer system improvements restrictions need to be placed on new on-site systems and package plants. The following restrictions apply to the entirety of South Bass Island:

- No new package plants shall be permitted; connection to the Put-in-Bay sewerage system shall be required.
- No replacement package plants shall be permitted; connection to the Put-in-Bay sewerage system shall be required.
- No expansions to existing package plants shall be permitted; connection to the Put-in-Bay sewerage system shall be required. This shall not preclude an expansion to a system that is in violation of its National Pollutant Discharge Elimination System (NPDES) permit and expansion is necessary to handle existing flows so long as a connection to the Put-in-Bay system is not available or accessible. If a plant is expanded under this condition, no additional connections to the system will be permitted.
- Repairs to maintain proper operation are allowed when they do not change the design capacity of the package plant.
- No new onsite or off-site sewage treatment systems shall be permitted:
    - except for the limited situations identified in the Ohio EPA's 2008 Findings and Orders;
    - until the Special Connection Ban in the Ohio EPA's 2008 Findings and Orders has been lifted.
- Existing on-site and off-site sewage disposal or treatment systems may not be replaced, repaired, or upgraded where a sanitary sewer connecting to the Put-in-Bay sewerage system is Available and Accessible (see **Chapter 6**).
- The term "off-site sewage system" means a sewage system with a discharge that will leave the property where the system is located, including, but not limited to a discharge to a storm sewer, ditch, or surface water.

Future Needs

- Sewer extensions will be needed to provide service in the Township portions of South Bass Island, and some parts of the Village of Put-in-Bay as well. The township portions are estimated at millions.
- The existing wastewater plant requires additional capacity for future needs. The Village, Township, and County have entered a long-term agreement that addresses service needs for South Bass and Gibraltar Islands; Stone Lab on Gibraltar Island was connected to the Put-in-Bay sewer in 2007. Sewage flows vary greatly by season and weekday versus weekend.

  The capital improvement plan for the Put-in-Bay FPA is shown in Table 5-53.

Table 5 - 53: Put-in-Bay FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs ($)						
			2025	2026	2027	2028	2029	2030	Future
Delaware St. 400' sewer lining	PIB				50,000				
Biosolids Drying Pad Upgrade	PIB	**100,000**			100,000				
PIB Township Sewer Extensions	Ottawa County	**TBD**							2045
Storm from Toledo to Cincinnati		**50,000**	50,000						
Cincinnati storm sewer to Bath Street to lake discharge		**60,000**		60,000					
Storm from Concord Str to Erie Str		**50,000**			50,000				
Stoiber Dorms to park drain system		**50,000**				50,000			

Several additional infrastructure projects are underway with costs and timelines to be updated. New 3" forced main from monument to LS to Toledo gravity sewer for future use

- Sybil LPS from water plant to Langram Ave. gravity sewer
- Toledo Ave LPS to Langram Ave.
- Reverse flow on Loraine Ave. to wastewater plant, lowering load on the Bathhouse LS
- Extending Shore Villas/East Point Rd. LPS system
- Extension of gravity sewer from Catawba LS to State Park using Catawba Ave.
- Change flow from Bayshore Resort to Back Bay Condos to lower loading on Bath Str. LS

Rocky Ridge Facility Planning Area

The Rocky Ridge Facility Planning Area (FPA) is a designated region within the village of Rocky Ridge where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Rocky Rideg (Figure 5-21). The Rocky Ridge FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by Designated Management Agencies from the Rocky Ridge. The responsibilities of these agencies are outlined below:

Designated Management Agency Responsibilities:

- **Rocky Ridge**: Responsible for planning public sewerage system; and will own and operate it if, and when built.

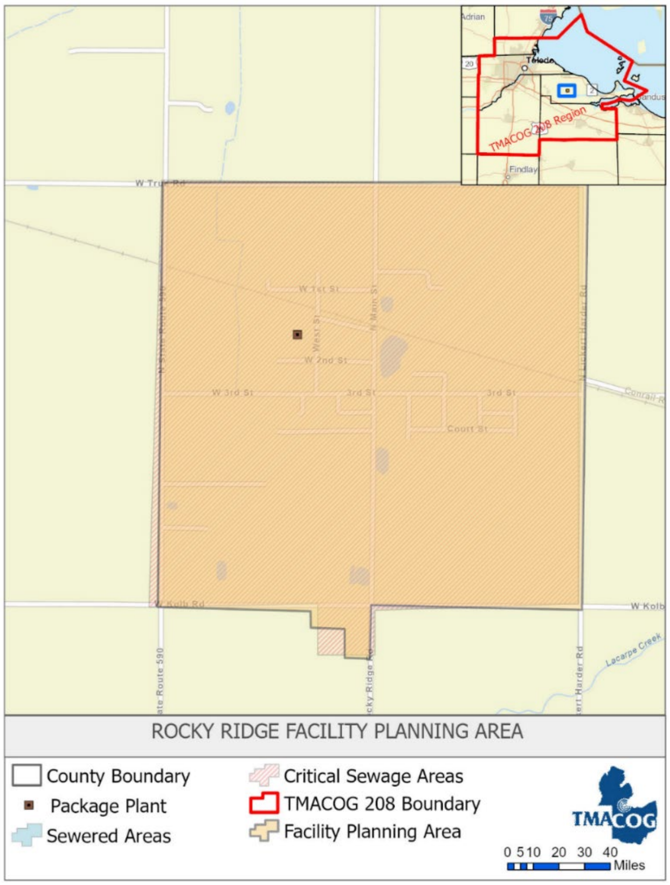


Figure 5 - 20: Rocky Ridge Facility Planning Area

Table 5 - 54: Rocky Ridge Area Population

Area	Population
Rocky Ridge, entire jurisdiction	312
Estimates within the FPA boundary	

Source: U.S. Census 2020 decennial census.

Present Facilities

The Village of Rocky Ridge does not have a treatment or a collection system and has been identified as having health problems due to the presence of septic tank effluent in the local ditches. Rocky Ridge School has a 2,100 gpd package plant; otherwise, the Village is served by individual septic systems, many of which are believed to be failing.

Package plants located in the FPA are listed in Table 5-55.

Table 5 - 55: Package Plants in the Rocky Ridge Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Zinser Homestead[I]	OT-08	Private	1984	2PT00029	2,100

[I]Status is inactive

Note: Data are based on current available data as of April 2019

Issues

Rocky Ridge's need for a public sewerage system has been long documented. The town is not under orders, however, and there is no currently active project.

The Toussaint River TMDL notes, "Further downstream at Rocky Ridge Road (RM 10.45), fecal coliform bacteria levels exceeded the PCR [Primary Contact Recreation] criterion on one occasion and strontium levels remained elevated. Bacteria levels were likely influenced by the discharge of poorly treated sewage from the unsewered Village of Rocky Ridge."

Future Needs

Rocky Ridge should prepare a General Plan to identify the most cost-effective sewerage option. Implementation should include preparing a financing plan that will make the system affordable to residents. An income survey may be needed to support grant and low interest loan applications.

Building sewers in Rocky Ridge would be expensive because of its shallow bedrock. On the positive side, the Village seems likely to qualify for grant programs. If a sewer system were built, the most likely treatment options would be:

- A new treatment plant for Rocky Ridge.
- Tap into the existing Oak Harbor system; the western edge of the Oak Harbor FPA is about 2.5 miles from the eastern corporate limits of Rocky Ridge.

The capital improvement plan for the Rocky Ridge FPA is shown in Table 5-56.

Table 5 - 56: Rocky Ridge FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2025	2026	2027	2028	2029	2030	Future
Rocky Ridge Sanitary Sewer Project	Ottawa County	TBD							2045

SANDUSKY COUNTY FACILITY PLANNING AREAS

Last Updated, 2023

Bellevue Facility Planning Area

Designated Management Agency Responsibilities:

- **City of Bellevue**: Owns and operates wastewater treatment facilities, and collection system within the corporate limits.
- **Sandusky County:** Will own and operate the collection system, if and when built, in Sandusky County unincorporated areas, connecting to City system for treatment services.
- **Erie County:** Owns and operates the collection system in Erie County unincorporated areas, connecting to City system for treatment services.
- **Seneca County:** Owns and operates the collection system in Seneca County unincorporated areas, connecting to City system for treatment services.
- **Huron County:** Owns and operates the collection system in Huron County unincorporated areas, connecting to City system for treatment services.

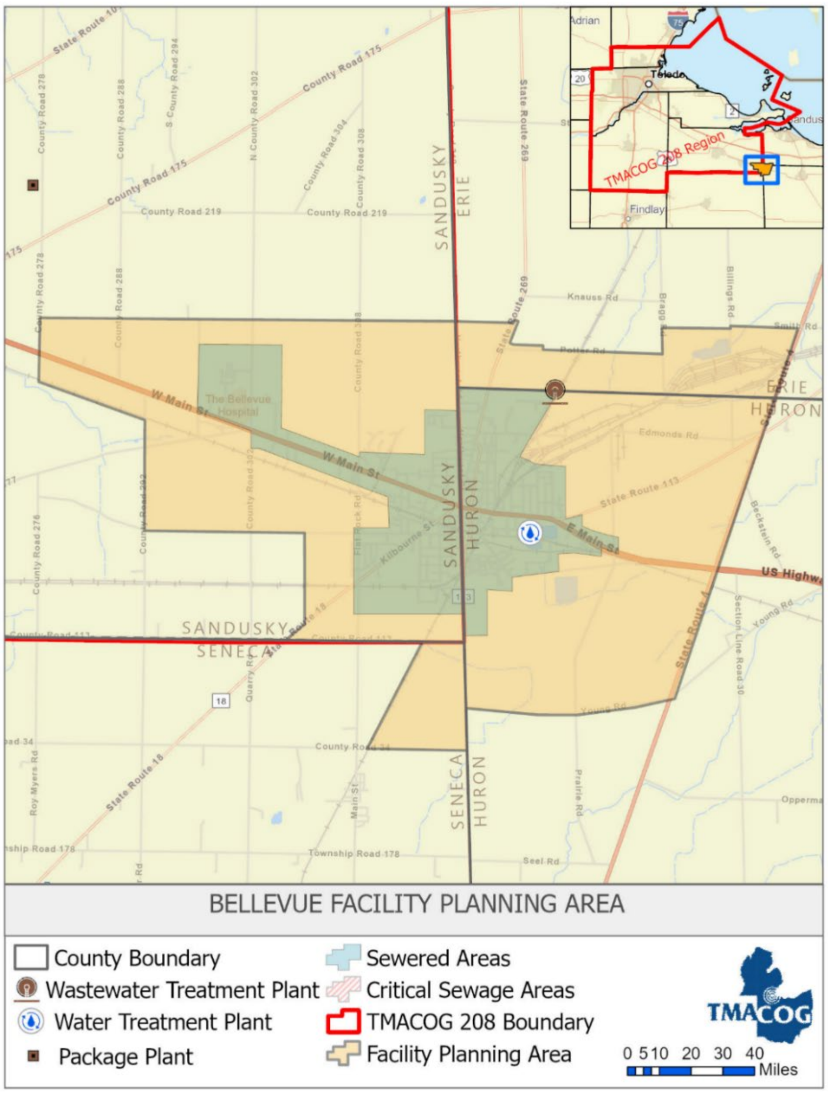


Figure 5 - 21: Bellevue Facility Planning Area

Table 5 - 57: Bellevue Area Population

Area	Population
Bellevue, entire jurisdiction *	8,249
Groton Township, entire jurisdiction (Erie County)*	1,379
York Township, entire jurisdiction (Sandusky County)*	2,479
Thompson Township, entire jurisdiction (Seneca County)*	1,370
Lyme Township, entire jurisdiction (Huron County)*	873
Estimates within the FPA boundary	

*only part of this jurisdiction is within the FPA boundary.

Source: the U.S. Census 2020 decennial census

Present Facilities

The Bellevue WWTP was originally built in 1969. With upgrades in 1988, 1993 and 2004, its capacity is 2.4 mgd, last expanded in 1997. Ohio EPA data shows an average flow of 1.19 mgd during the period of 2009-2018, and a peak flow of 5.03 mgd, which occurred in 2009. In 2020 the average daily flow was 1.13 mgd It is a plug flow plant with nitrification towers, aerobic sludge digestion, and ultraviolet disinfection. Sludge is aerobically digested and applied to land in thickened-liquid form or dewatered by belt filter press and disposed of in a landfill or composted. Bellevue currently in-vessel composts one-quarter of its biosolids. Bellevue has a pretreatment program to accept industrial wastewater.

Septage receiving station is not currently accepting septage as of 05/2020

Recent projects

- In 2012, extended sewers along U.S. Route 20 to the east to Prairie Road, total cost was $200,000.
- In 2013, installed new ultraviolet disinfection system with an enclosed building over the system to eliminate sun exposure, total cost was $386,000.
- The center hatches for both nitrification towers were removed for natural ventilation in 2014.
- 312 manhole cover inserts were installed throughout the collection system based on flooding areas of streets. As of 2016, five lift stations have been upgraded to a SCADA system, costs were $25,000 per lift station.
- Based on the NPDES permit, the City of Bellevue developed a Pollutant Minimization Program Schedule for total dissolved solids and bis (2-ethylhexyl) phthalate (BEHP) in 2013.
- Based on the NPDES permit, the City of Bellevue developed a Toxicity Reduction Evaluation Schedule and continues to monitor toxicity in the effluent monthly in 2013.
- In 2013, the WWTP purchased new trucks for the operations, maintenance, collection system, and Superintendent. Each truck is outfitted for the respective area. The collection truck is outfitted with a crane for removal of pumps in the collection system.
- November 2015, the City of Bellevue purchased a sewer jet and has been utilizing the truck within all City departments. Total costs were $526,000 as part of a 5-year lease. The City purchased a mapping system to monitor and capture points of activities throughout the collection system, along with water main breaks, cleaning of catch basins, and lift stations. The Mobile 311 mapping

system cost $5,200.

- August 2016, the WWTP purchased and installed dissolved oxygen probes for the aeration tanks along with VFDs on the blowers. This works with dissolved oxygen set points in the aeration tanks that read back to the main screen and will increase or decrease blower speed to meet the desired set point. This was done to decrease energy consumption and to keep a constant DO throughout the aeration tanks. Total cost was $110,000.
- In 2016, the Redwood lift station was upgraded to include new pumps, pump rails, SCADA system, and new drywell valve pit.
- In 2017, the Hospital and Trilogy lift stations were upgraded to include new pumps, pump rails, SCADA system, and drywall valve pit. Total cost was $50,000.
- In 2019 2 new VFD drives for nitrification towers $8,000 a piece, GPS locater for assest management program $11,000, new drive and rehab # 1 intermediate clarifier $40,000, 6 new LED pole lights around intermediate clarifiers $ 3,000.
- In 2020, 14 new LED light poles throughout plant grounds $ 15,000, upgrade Brandon and Flatrock Trailer park lift station panels $25,000 per station, install new MLSS probe in aeration tank $ 4,000, install new bypass valve Attwood lift station $15,000, study on preliminary section of plant $ 50,000, upgrade preliminary section of plant to include new barscreen and grit chambers- headworks study to be completed by 12/2021 to determine cost, install new VFD panels for return pumps $ 15,000 total.
- In 2022 the Bellevue Wastewater Treatment Plant will be upgrading our headworks to include new grit chamber, grit pump, grit pump building, and new barscreen at main lift station.

Package plants located in the FPA are listed in Table 5-58.

Table 5 - 58: Package Plants in the Bellevue Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Norfolk and Western Railroad[A]	ER-11	Private	1967, 1971	2IT00010	2,500

[A]Status is active

Note: Data are based on current available data as of April 2019

Issues

Ohio EPA has raised concerns about Flat Rock, an unincorporated town of about 80 houses plus a Children's Home in Thompson Township of Seneca County. It is unsewered and septic systems in the area are believed to be discharging to sinkholes in the karst bedrock. The Children's Home is served by a package plant.

The Bellevue plant currently is under no orders to upgrade. Bellevue's *Long-Term Biosolids Processing Plan* has been followed to make upgrades to sludge stabilization, an increase in aerobic digestion capacity, and other equipment upgrades/replacements.

New Subdivisions

It is the policy of the Plan that all new residential subdivisions that are required to be platted under Sandusky County subdivision regulations within the FPA boundary shall connect to public sewers and be served by the Bellevue wastewater treatment plant. Neither package plants nor septic systems for each individual lot shall be permitted in these cases.

Karst Bedrock Formations

Bellevue lies in the heart of a karst limestone geologic formation that stretches from Seneca County to Lake Erie at Sandusky. Karst bedrock is porous, with sinkholes that allow surface runoff to drain directly into groundwater. Because karst limestone is porous, water flows through it much more quickly. Drinking water sources that draw their supply from the karst aquifer are very vulnerable to contamination. Contaminated water may also reach Lake Erie through karst formations. Discharges of wastewater effluent from public or private treatment plants, or drain septic tanks into sinkholes should not be permitted.

Future Needs

- Replace nitrification tower media, including removal and/or repair of covers. Replacement of media is set for 2019.
- Flat Rock is about one and one-half mile south of the Bellevue FPA boundary. Since it is in Seneca County, it is not in TMACOG's designated planning area. Including Flat Rock in the Bellevue Planning Area would be contingent upon an agreement between Seneca County and the City of Bellevue. FPA boundary changes in Seneca County would need to be approved by Ohio EPA.
- The City of Bellevue will continue to address inflow and infiltration.
- The City of Bellevue is looking at piloting a process that uses a resin plate to remove phosphorus in June 2017. This process would eliminate the need for any chemicals for phosphorus removal and lower the TDS throughout the plant.
- The City of Bellevue's NPDES permit issued in 2017 calls for meeting the final effluent limit of 0.5 mg/L for phosphorus by 2020. As of May 2017, the effluent has been at or below 0.5 mg/L.
- The NPDES permit calls for Bellevue to implement/construct treatment process changes and/or pretreatment changes to achieve WET limits of 1.0 TUa and TUc by 2021.
- In 2018, the City of Bellevue will be replacing two of the intermediate clarifier drives and rehabilitating the clarifiers at the WWTP.

The capital improvement plan for the Bellevue FPA is shown in Table 5-59.

Table 5 - 59: Bellevue FPA Capital Improvement Schedule

Project	DMA	Total Cost			Annual Capital Improvement Needs				
			2022	2023	2024	2025	2026	2027	Future
Address I & I	Bellevue	**$500,000**	100,000	100,000	100,000	100,000			100,000
WWTP Improvement Projects (Complete)	Bellevue								
WWTP Headworks Improvement	Bellevue	$2,612,000	X	X					
Gardner Rd. West Sewer Extension	Bellevue								
		$3,112,000							

Burgoon Facility Planning Area

Designated Management Agency Responsibilities:

- **Village of Burgoon**: Responsible for planning, building, and operating its public sewerage system. Treatment services are provided by the Bettsville WWTP.

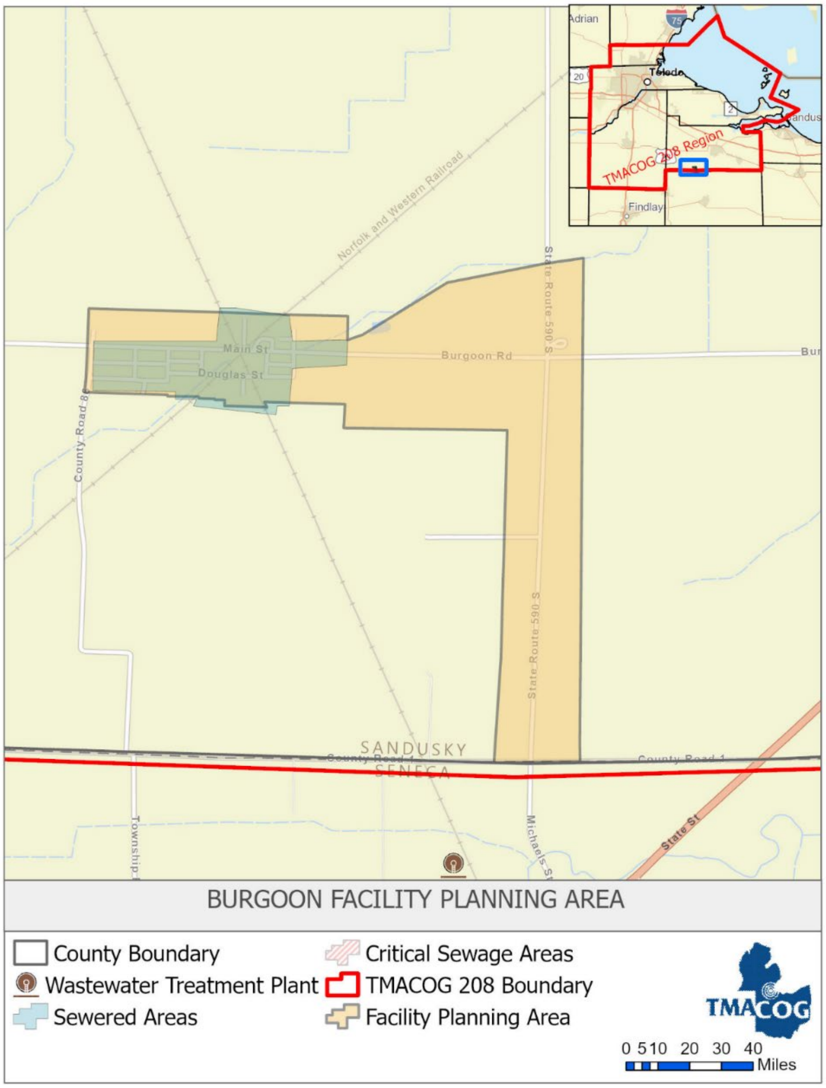


Figure 5 - 22: Burgoon Facility Planning Area

Table 5 - 60: Burgoon Area Population

Area	Population
Burgoon, entire jurisdiction	183
Estimates within the FPA boundary	

Source: the U.S. Census 2020 decennial census

Present Facilities

Burgoon completed its sanitary sewerage system in 2006 and connects via force main to the Bettsville WWTP for treatment services, which is located 1.5 miles southeast. The entire project for both communities, including sewer systems and a WWTP cost approximately $6.7 million: cost for the WWTP was $4.9 million, and Burgoon's sewer system was $1.8 million.

Future Needs
There are no projects planned for the Burgoon FPA at the present.

Clyde Facility Planning Area

Designated Management Agency Responsibilities:

- **City of Clyde**: Owns and operates wastewater treatment facilities, and the collection system within the corporate limits.
- **Village of Green Springs**: Owns and operates the wastewater collection system within its corporate limits, up to the lift station that connects to the Clyde system.
- **Sandusky County:** Will own and operate collection system, if and when built, in Sandusky County unincorporated areas, connecting to City system for treatment services.
- **Seneca County**: Will own and operate collection system, if and when built, in Seneca County unincorporated areas, connecting to Village system for treatment services.
- **Ohio Turnpike Commission:** Owns and operates the wastewater collection and pumping system at the Commodore Perry and Erie Island Plazas, up to the Commission's right of way.

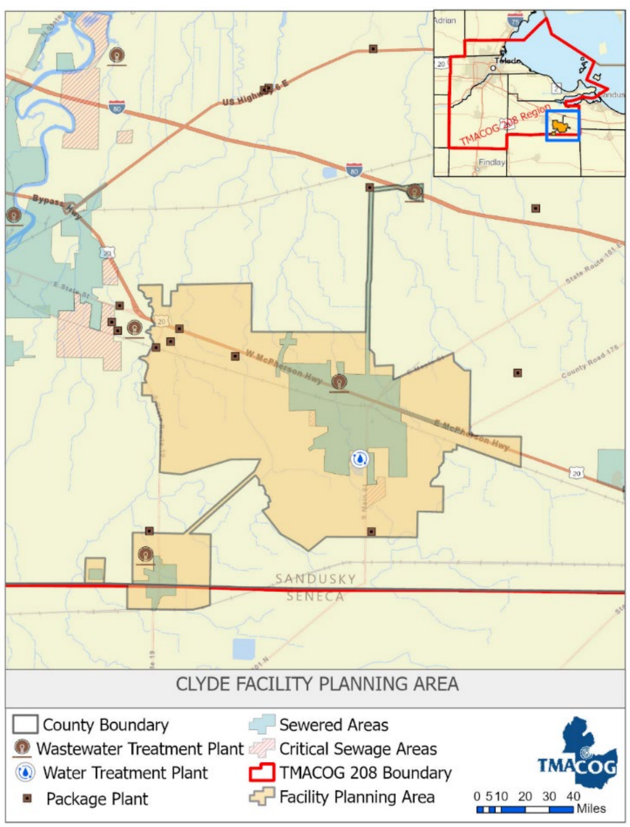


Figure 5 - 23: Clyde Facility Planning Area

Table 5 - 61: Clyde Area Population

Area	Population
Clyde, entire jurisdiction	6,294
Green Springs, entire jurisdiction	1,233
Green Creek Township, entire jurisdiction (Sandusky County)*	3,389
York Township, entire jurisdiction (Sandusky County)*	2,479
Adams Township, entire jurisdiction (Seneca County)*	1,247
Total	14,642

*only part of this jurisdiction is within the FPA boundary.

Source: the U.S. Census 2020 decennial census

Present Facilities

The Clyde WWTP is an oxidation ditch plant, with aerobic digesters, sludge thickeners, and ultraviolet disinfection. A bio-solids centrifuge was installed in 2006.

The treatment process is followed by a pair of tertiary lagoons before discharging to Raccoon Creek. The City of Clyde operates an industrial wastewater pretreatment program. The plant has a short-term duration capacity of 7.5 mgd for a 2.0 – 3.0 hour event. The facility begins to flood at 9.0 mgd. Ohio EPA data shows an average flow of 1.877 mgd, and a peak flow of 7.230 mgd during the period of 2004-2009, before flow from Green Springs was added to the system. Before Green Springs tapped into the Clyde system, its average daily flows in 2005-2006 were 0.203 mgd at the WWTP, or 0.22 mgd of total flow including the WWTP and estimated combined sewer overflow (CSO) bypass.

A Wet Weather Stress Test in July 2004 showed the Clyde WWTP can handle 5.0 mgd of wet weather flows for the duration of most storm events. The plant cannot handle that flow indefinitely, but it should allow the plant to handle 2.0-2.5 mgd on a yearly average.

The former Green Springs wastewater treatment lagoon covers 2.5 acres and has a capacity of 5.5 million gallons. It was designed with a six-inch compacted clay liner and was installed with little or no excavation over 50 to 70 feet of glacial deposits above bedrock. The lagoon's earthen wall is about seven feet high. At its base the existing grade is about 15 feet above the 100-year floodplain. The effluent discharge has been eliminated; the lagoon is used for stormwater equalization. Wastewater from Green Springs is transported to the Clyde system for treatment.

In 2005, Green Springs developed a Long-Term Control Plan (LTCP) that recommended collecting system improvement to reduce extraneous flow, and sewer separation program to reduce annual average flow from 0.25 mgd to 0.175 mgd. These improvements were completed in 2012.

The Ohio Turnpike and Infrastructure Commission proposed the construction of a new sewage pump station and collections systems for the Erie Islands and Commodore Perry Service Plazas, which are located along the Ohio Turnpike at milepost 100.0 in Sandusky County, Ohio. The existing wastewater treatment package plant has been demolished, and all sanitary flows are being pumped to the existing City of Clyde sewage treatment plant.

This project was outside of the established boundaries for service of the Clyde FPA and as such required a change to include the service station and collection lines. The project was completed in mid-2023.

Package plants located in the FPA are listed in Table 5-62.

Table 5 - 62: Package Plants in the Clyde Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Club Rog[A]	SA-13	Private	1986	2PR00170	2,000
Emerald Estates[A]	SA-11	Private*	1969		17,000
Green Hills Inn and Golf Course[A]	SA-09	Private*	1964		13,000
Mid City Mobile Homes[A]	SA-10	Private*	1970		30,000
Wahl Refractories[A]	SA-65	Private	1990	2IN00193	3,000

[A]Status is active
*Facility type is assumed
Note: Data are based on current available data as of April 2019

Issues

Clyde's system has one CSO. This CSO was upgraded during 2004 by the installation of a CSO Screening Facility. Clyde operates under a federal consent decree entered into during the summer of 2004. The essence of the decree is that Clyde shall operate their wastewater treatment plant within the limits of the National Pollutant Discharge Elimination System (NPDES) Permit; shall be subject to fines for violations of the permit, and shall submit a LTCP. Clyde's LTCP was submitted and approved by Ohio EPA in 2008.

The Green Springs sewer system has two inactive CSO structures, on Maple Lane and Clay Street. The last active CSO was at the imhoff tank near the former wastewater treatment lagoon. In connecting to Clyde, it was eliminated, leaving the Clyde Screening Facility as the one remaining CSO.

Combined sewer and I/I problems account for a significant portion of Green Springs' flow. During wet weather, excess flows overflow and discharge to Flag Run Creek. Between 1996 and 2002, Green Springs completed several sewer separation projects along Catherine, South Leonard, Euclid, and West Adams Streets; between Euclid and West Adams; and for Kansas Street south of Adams. The Green Springs LTCP indicates that about 60% of the sanitary sewers in the village are to some degree separated from storm sewers.

In 2004, Clyde designed a sanitary sewer system to serve Frank's Subdivision, aka Woodland Heights, west of Clyde. The Sandusky County Health Department (SCHD) has identified the subdivision as a *Critical Sewage Area.*

The County is currently finishing up a study via MS Consultants, INC. evaluating the area west of Clyde between State Route 20 and the airport. This includes Emerald Estates and Mid City Mobile Home package plants.

The SCHD has identified the area of Erlin Rd, CR 232 from US 20 to Bockmeyer Road as a *Critical Sewage Area.*

New Subdivisions

It is the policy of the Plan that all new residential subdivisions that are required to be platted under Sandusky County subdivision regulations within the FPA boundary shall connect to public sewers and be served by the Clyde wastewater treatment plant. Neither package plants nor septic systems for each individual lot shall be permitted in these cases.

Force Main Availability

The Clyde FPA consists of two non-contiguous service areas: that of Clyde and surrounding areas, and that of Green Springs and its surrounding areas. Green Springs connects to Clyde via a force main along Shaw, Riehl, Spayd, and Dewey Roads.

City of Clyde is the Designated Management Agency and may determine the availability of the sewer line for additional connections along the route between Green Springs and Clyde. Connections may be established on a case-by-case basis. The City of Clyde and the SCHD have established criteria for when connections will be allowed and when connections may be required as follows:

1. New construction of dwellings will be required to connect. SCHD will not issue permits for new septic systems.
2. Construction of new businesses will be required to work with Ohio EPA and the City of Clyde.
    a. If a homeowner wishes to add on to a home thereby increasing the design flow, it will be required that they connect to the sanitary sewer rather than increasing the size of the septic system.
3. Septic systems are not expected to be permanent and therefore, it is expected that as time goes on, all septic systems will fail and as this happens, homeowners should contact SCHD and Clyde for permission to connect to the sanitary sewer. As these connections are made, property owners will be required to properly abandon septic tanks and should contact SCHD for specific information.
4. Upon receipt of a complaint regarding a failed septic system, if SCHD determines that the system has failed and/or is creating a public health nuisance, connection to the sanitary sewer will be required.
5. If a property owner has a desire to connect to the sanitary sewer for any other reason, they may make a request to the City of Clyde which will make the final determination if the connection is allowed.

Karst Bedrock Formations

Clyde lies along the west edge of a karst limestone geologic formation that stretches from Seneca County to Lake Erie at Sandusky. Karst bedrock is porous, with sinkholes that allow surface runoff to drain directly into groundwater. Because karst limestone is porous, water flows through it much more quickly. Drinking water sources that draw their supply from the karst aquifer are very vulnerable to contamination. Contaminated water may also reach Lake Erie through karst formations. Discharges of wastewater effluent from public or private treatment plants, or drain septic tanks into sinkholes should not be permitted.

Future Needs

- Wastewater treatment plant plans call for the following improvements, included in the capital improvements table, shown below.

    - Installation of an “Actiflo” ballasted flocculation system or chlorination/de-chlorination at the CSO Screening Facility for wet weather overflows.
- An addendum to Clyde’s LTCP recommends an implementation schedule to reduce extraneous flows into the sanitary sewer system. After completion of sewer separation projects, a system evaluation is planned to determine whether an equalization basin is needed to meet CSO reduction goals. The implementation schedule is included in the capital improvement table, shown below.
- Clyde plans to provide service to developing areas through sewer extensions. The schedule will depend on demand and development. The areas include:
    - Main Street north of present service area.
    - Woodland Avenue north of present service area.
    - Service to the Sandusky County Airport; Clyde will be the provider of sanitary sewerage facility to the Airport and the proposed industrial park.
    - Woodland Heights (Franks, Coe, and Woodland Court).
    - Maple-Woodland-Limerick area southwest of current service area.
    - Main Street south of Fox, Limerick, and South Ridge, south of present service area.
    - East of present service area, bounded by Durnwald and South Ridge, and along the north side of US 20.
- The Village Green Springs has an individual NPDES permit for its collection system. The permit requires several projects to address infiltration and inflow problems.
    - Complete and implement an infiltration and inflow study to identify and eliminate sources of excessive I/I by 2018.
    - Enforce the village ordinance prohibiting the connection of downspouts and sump pumps from the sanitary sewer system.
    - Complete construction and attain operational level of sewer separation improvements by 2019.

Fremont Facility Planning Area

Designated Management Agency Responsibilities:

- **Fremont:** Owns and operates the wastewater treatment plant, and sanitary sewers within its corporate limits.
- **Sandusky Township Sewer District:** Owns and operates local collector sanitary sewers within its boundaries.
- **Sandusky County:** Owns and operates sanitary sewers in unincorporated areas outside the Sandusky Township Sewer District. In addition, Sandusky County operates and maintains an interceptor sewer and pump stations within the Sandusky Township Sewer District. The District’s local collector sewers

discharge to the interceptor sewer, which conveys wastewater to Fremont.

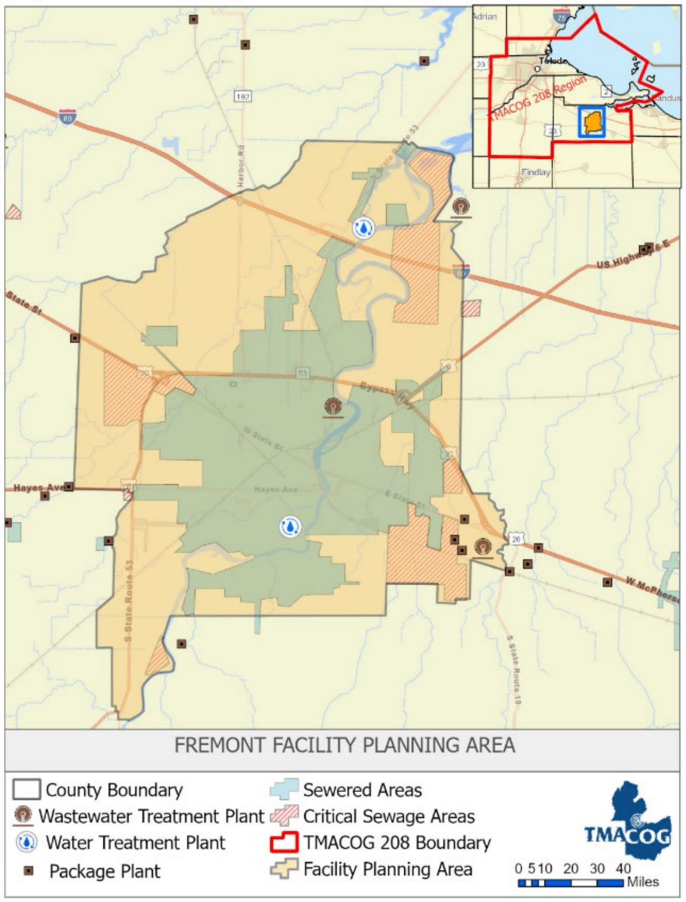


Figure 5 - 24: Fremont Facility Planning Area

Table 5 - 63: Fremont Area Population

Area	Population
Fremont, entire jurisdiction	15,930
Ballville Township, entire jurisdiction*	6,042
Green Creek Township, entire jurisdiction*	3,389
Rice Township, entire jurisdiction*	1,143
Riley Township, entire jurisdiction*	2,242
Sandusky Township, entire jurisdiction*	3,551
Total	32,297

*only part of this jurisdiction is within the FPA boundary.

Source: the U.S. Census 2020 decennial census

Present Facilities

Fremont's WWTP is an A2O Biological Nutrient Removal (BNR) activated sludge plant designed for 7.6 mgd daily average flow and 24 mgd peak flow. Its facilities include mechanical bar screens, grit removal, A2O activated sludge, secondary clarifiers, tertiary cloth disc filters, UV disinfection, Autothermal Thermophillic Aerobic Digestion (ATAD) of biosolids, and centrifuge dewatering. Sludge is currently being dewatered and taken to a landfill. The new treatment facility came on-line in March 2016 and the average flow for 2019 was 8.691 mgd with a peak daily flow of 25.199 mgd. The new facility was constructed with a cost of $63.3 million. The City of Fremont operates an industrial wastewater pretreatment program.

Package plants located in the Fremont FPA are listed in Table 5-64.

Table 5 - 64: Package Plants in the Fremont Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Fremont Baptist Temple & Christian Academy[A]	SA-01	Private	1973	2PR00206	8,000
Misty Meadows Camp[A]	SA-03	Private*	1982	2PR00296	6,300
Golden Chance Apartments[A]	SA-08	Private*	1971		2,500
Plaza Lanes[A]	SA-12	Private	1984	2PR00204	5,000

[A]Status is active
*Facility type is assumed
Note: Data are based on current available data as of April 2019

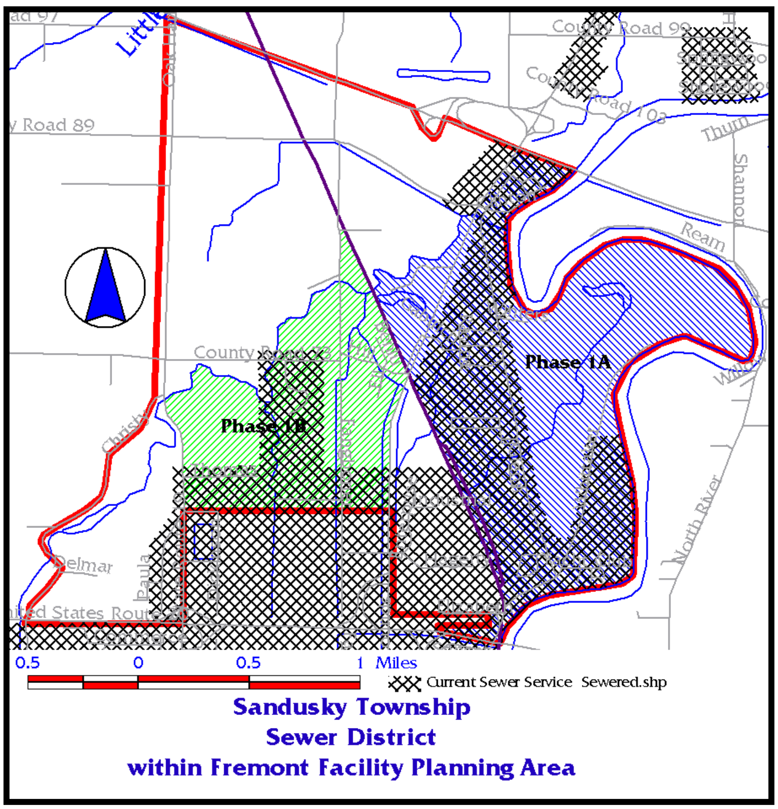


Figure 5 - 25: Sandusky Township Sewer District in the Fremont FPA

Issues

The Sandusky County Health Department identifies the following Critical Sewage Areas where public sewers are needed:

- Christina Drive
- Country Club Estates

- Four Mile House Road
- Hayes/53
- Muncie Hollow
- Rambo Rd
- Twp Line / Cole
- West State Street

New Subdivisions

It is the policy of the Plan that all new residential subdivisions that are required to be platted under Sandusky County subdivision regulations within the FPA boundary shall connect to public sewers and be served by the Fremont wastewater treatment plant. Neither package plants nor septic systems for each individual lot shall be permitted in these cases.

Combined Sewers

Like many municipalities, Fremont's sewer system includes combined sanitary and storm sewers. After rain storms, sewage may overflow into the Sandusky River at fourteen combined sewer overflows (CSOs). Of these, five are active. The others are blocked off and used only in emergency situations.

In 1991, Fremont began a multi-phase sewer separation program. By 1999, seven phases were complete, with #8 scheduled for 2000. In addition, Fremont has separated sewers in the following areas: East State Street, West State Street, Castalia Road, Walnut Street, and Morrison Road. In all, combined sewer overflow volumes have been reduced by approximately 89%.

In 2007, Fremont evaluated its CSO options. Complete separation was estimated at $106 million; this option was not found to be cost effective. The Long-Term Control Plan (LTCP) was completed in 2007, and the final No Feasible Alternative Analysis (NFA) in January of 2012. Overall, it calls for a series of improvements from 2008-2028, and includes the following major elements:

- New headworks facilities.
- A new secondary treatment process with an average design flow of about 7.6 mgd and a peak flow of 24 mgd.
- A high-rate treatment system, if determined necessary by an evaluation process, for storm-related flows.
- Several collection system improvements to reduce extraneous flows.

The improvements are designed to reduce the CSOs to four (4) or less per year at a new wastewater treatment facility. The City will investigate all sources of funding including grants, and loans, and rate increases to finance the improvements.

Unsewered Areas

The Sandusky County Health Department has identified several unsewered portions of the Fremont FPA as *Critical Sewage Areas*. These include:

- Areas along the east bank of the Sandusky River in Sandusky and Riley Townships, especially Muncie Hollow and the areas between Kelly and Scranton Roads.
- Rambo Lane and South River Road, south of Fremont in Ballville Township along the river between Roth and Havens Station Road.

Future Needs

- Extend sanitary sewers to developed unsewered areas throughout the Planning Area. The top priorities should be the Critical Sewage Areas.
- Eliminate package plants by connecting them to the public system when proximity of sewers makes this financially feasible.
- As package plants and septic systems are eliminated additional WWTP capacity should be considered. The Fremont WWTP provides substantially better treatment than package plants and septic systems; therefore its expansion will reduce pollutant loading to the Sandusky River.
- Continue financing and constructing the LTCP to reduce the CSOs to four (4) or less per year. The milestones of the LTCP under the city's NPDES permit are:
    - A high flow rate treatment facility by 2025.
    - Eliminate Fulton Street (Bull Run Interconnection) CSO by 2022.
    - West Side CSO conveyance completion by 2024.
    - Pine Street separation construction completion and operational by 2028.
    - Complete "Common Projects" (Walnut Street storm outfall, Sand Road Pond Stormwater Pumping Station and Outfall) by 2028.
    - LTCP Common Projects construction completion and operational by 2028.

This plan supports state and federal financial assistance to implement these facility improvements. The capital improvement plan for the Fremont FPA is shown in Table 5-65.

Table 5 - 65: Fremont FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2022	2023	2024	2025	2026	2027	Future
High Rate Clarification	Fremont	**$5,900,000**	5,900,000						
Fulton Street CSO	Fremont								
Pine Street CSO	Fremont	**$7,200,000**			7,200, 000				
Common Projects - Walnut Street, Sand Rd	Fremont	**$4,400,000**			4,400, 000				
Sand Road Pond Overflow/Equalization	Fremont	**$1,000,000**							

Upgrade Lift Stations	Sandusky County	**$500,000**		500,000					
Rice Twp Sewers (Phase 4)	Sandusky County	**$600,000**							600,000
		$19,400,000							

Gibsonburg Facility Planning Area

Designated Management Agency Responsibilities:

- **Village of Gibsonburg**: Owns and operates wastewater treatment facilities, and the collection system within the corporate limits.
- **Sandusky County:** Owns and operates a collection system for White Star Park for the Sandusky County Park District in Sandusky County unincorporated areas, connecting to Village system for treatment services.

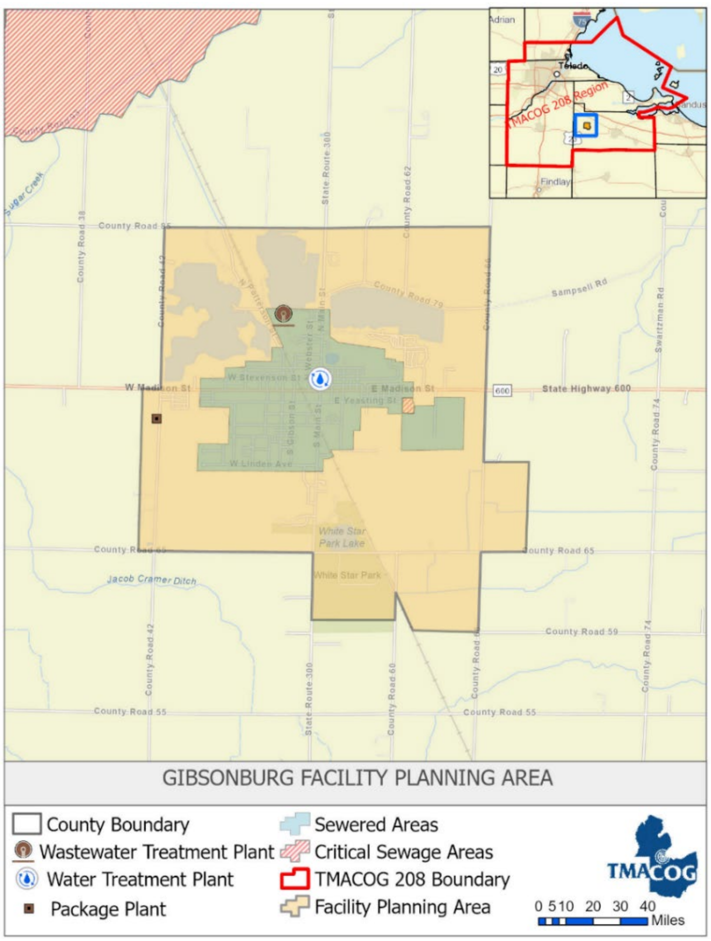


Figure 5 - 26: Gibsonburg Facility Planning Area

Table 5 - 66: Gibsonburg Area Population

Area	Population
Gibsonburg, entire jurisdiction*	2,452
Madison Township, entire jurisdiction*	3,887
Total	6,339

*only part of this jurisdiction is within the FPA boundary.

Source: the U.S. Census 2020 decennial census

Present Facilities

The Gibsonburg WWTP is an oxidation ditch facility with aerobic digestion, chlorination/dechlorination, and sludge drying beds. The facility's rated capacity is 0.5 mgd average daily and 1.23 mgd peak daily. In 2009, the average daily flow was .379 mgd as compared to the average daily flow of .471 mgd in 2007, which was before the Hurlbut Ditch Relocation project.

The sewers were designed as a combined system, using existing storm sewers and septic tanks. The septic tank effluent discharges to the combined sewer system; the village is responsible for the handling of septage. The septic tanks reduce the strength of raw sewage by settling out solids; BOD_5 is about 125 ppm. Effluent discharges to Hurlbut Ditch and Dromm Ditch/Wolf Creek, both Portage River tributaries. The sewer system has two CSOs and a 1.748 million gallon overflow retention basin. The basin is aerated for a design storm of 0.25 inches per hour.

The package plant located in the FPA is listed in Table 5-67.

Table 5 - 67: Package Plants in the Gibsonburg Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Atlas Engine Works[A]	SA-17	Private	1975	2IS00003	8,000

[A]Status is active

Note: Data are based on current available data as of April 2019

Issues

The Sandusky County Health Department has identified Rodriguez Street area in Madison Township as a Critical Sewage Area. This area is on the south side of SR 600 just east of the Village limits. A Planning study was prepared for road, storm sewer, sanitary sewer, and water line improvements in 2013.

Gibsonburg prepared a combined sewer overflow (CSO) abatement study. A phased village-wide sewer separation was estimated to cost $7.7 million. The first phase, a $45,000 project along Linden Avenue for the Quarry Village Apartments area, was constructed in 1998.

In 2007, Ohio EPA approved the Village's Combined Sewer System Long-Term Control Plan (LTCP). The study found that the majority of combined sewerage overflows came from the West Branch CSO. A large part of the extraneous flow comes from 584 acres of agricultural land south of the Village. This area drains to Hurlbut Ditch; and the flow from the ditch enters the combined sewer system, overloading the West branch CSO area. Hurlbut Ditch was re-routed around the village so that these flows do not enter the sewer will greatly reduce extraneous flows.

The first project to implement the Combined Sewer System LTCP was completed in 2008. This first phase was to re-route Hurlbut Ditch around the west side of the village, eliminating its flows from the combined sewer system. The project cost was $1.68 million.

Before completion of the Hurlbut Ditch Relocation which was identified as Phase 1 of the Village's CSO LTCP, the wastewater treatment facility did not have additional capacity. The average daily flow upon completion of Phase 1 (2009) is 0.379 mgd which equals approximately 0.100 mgd of available capacity.

The second phase, completed in 2010, included new storm sewers on Yeasting and Madison Streets (west side) and on Madison, Main, Ohio, and Wilson Streets and Windsor Lane at a cost of $1,815,000.

In 2015, the Equalization Basin improvements were complete.

Between 2016-2017, the LTCP was altered and approved by Ohio EPA. The approved change was for a more cost-effective design that had been developed to eliminate the original design, which included grinder pumps. The original design also included 675 lineal feet of 2" force main on W. Stone Street, 290 lineal feet of 8" diameter gravity sewer on W. Yeasting Street, and 380 lineal feet of 10" diameter storm sewer on W. Stevenson Street. The new design included a 8" storm sewer for the project area. This allows the existing sewers to remain in service and act a s a sanitary sewer only. The new storm sewer collects all surface drainage and other clean water connections and discharges to a nearby stream.

In 2017, replaced the screw pumps at the WWTP. The two screw pumps were original to the plant.

In 2018, Sandusky County in conjunction with the Sandusky County Park District, extended both sanitary sewer and water systems from the Village of Gibsonburg for $804,000. The sewer system consists of five duplex grinder systems for the various facilities within the White Star Park.

In 2022 , the Village of Gibsonburg will clean and rip rap the section of the Hurlbut Ditch which runs along TR 42 as well as clean and rip rap where needed the Linden Avenue Ditch

Future Needs

- The Village of Gibsonburg's LTCP was approved last in August 2016. It includes:
    - Installation of storm/sanitary sewer separation in five phases.
        - Separate storm sewers have been installed on Main Street between Cedar Street and Lime Street. This project was completed by the December 31, 2021 deadline
        - Completed construction of separate storm sewers in alley between Main St. and Webster St. south to Stevenson St. have been completed by the Ohio EPA revised December 31, 2022 deadline.
        - Complete construction of separate storm sewers from Gibson and alley north of Smith St. by December 31, 2023.
        - Complete construction of CIPP liner in existing combined sewer on East Yeasting St. near Main St., and in the alley between Madison and Stevenson St. by December 31, 2025.
- In 2019, the Village of Gibsonburg completed a septic system project with Buckeye Sanitation.
- In 2019, the Village of Gibsonburg replaced the current Linden Avenue pump station.
- The Village of Gibsonburg continues to work with the Sandusky County Commissioners and Sandusky County Health Department to find an adequate sewer and water solution to those Madison Township residents living just outside of the corporation limits of the Village in the Rodriguez Street area. The Village of Gibsonburg resurfaced Rodriguez Street in 2021. The area is currently looking into

annexation with the village to address the sanitary sewer, storm sewer, water, and road issues.

- The Village of Gibsonburg completed the annexation of the @ 16 homes in the Rodriguez Street area in early 2022. With the allocation of American Rescue Plan Funds from the Sandusky County Commissioners, the Village of Gibsonburg will be addressing the deficient water and sewer issues that have long been an issue for the specific area. Currently, through the RFP process, Poggemeyer/Kleinfelder has been selected as the engineering design firm to assist with the project and the overall design for the water and sewer upgrades has begun. The complete project will be done by the December 31, 2024 deadline.

The capital improvement plan for the Gibsonburg FPA is shown in Table 5-68.

Table 5 - 68: Gibsonburg FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2022	2023	2024	2025	2026	2027	Future
Linden Avenue Pump Station	Village of Gibsonburg								x
Rodriguez Street Sanitary Sewer	Sandusky County/Village of Gibsonburg								x

Helena Facility Planning Area

Designated Management Agency Responsibilities:

- **Village of Helena**: Owns and operates the public sewerage system.

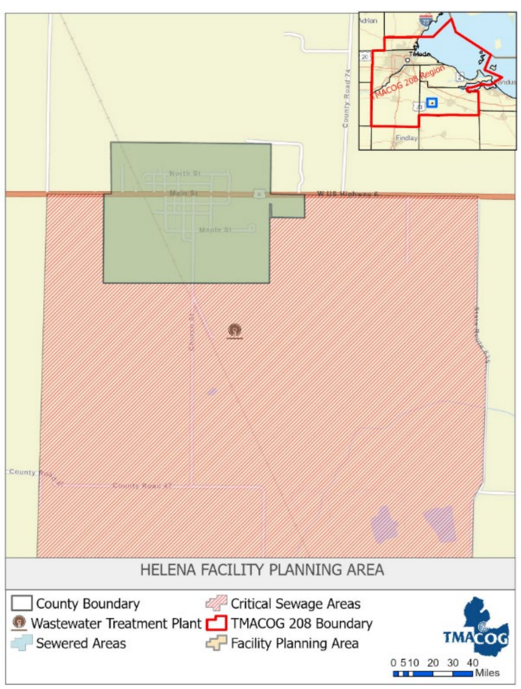


Figure 5 - 27: Helena Facility Planning Area

Table 5 - 69: Helena Area Population

Area	Population
Helena, entire jurisdiction	211
Total	**211**

Source: the U.S. Census 2020 decennial census

Present Facilities

Helena constructed a new wastewater treatment plant in 2010. The system consists of conventional gravity sewers and an extended aeration wastewater plant with a capacity of 40,000 gpd. The plant discharges to an unnamed tributary of Muddy Creek; its Class B sludge is disposed by discharge to a larger wastewater plant with sludge handling facilities. Sanitary sewers are available and accessible throughout the Helena FPA.

Future Needs

With completion of the wastewater treatment plant, the community's wastewater needs are fulfilled. Enforcement of sewer tap requirements should continue to make sure all houses and businesses are connected. There are no planned projects for the Helena FPA at the present.

Lindsey Facility Planning Area

Designated Management Agency Responsibilities:

Village of Lindsey: Owns the wastewater treatment facilities, and collection system within the corporate limits. Since February of 1992, the Village has a Technical Service Agreement with Sandusky County for assistance of their operations for the water and wastewater plants. This agreement was updated in January 2019.

Sandusky County: Will own and operate the collection system, if and when built, in Sandusky County unincorporated areas, connecting to the Village system for treatment services.

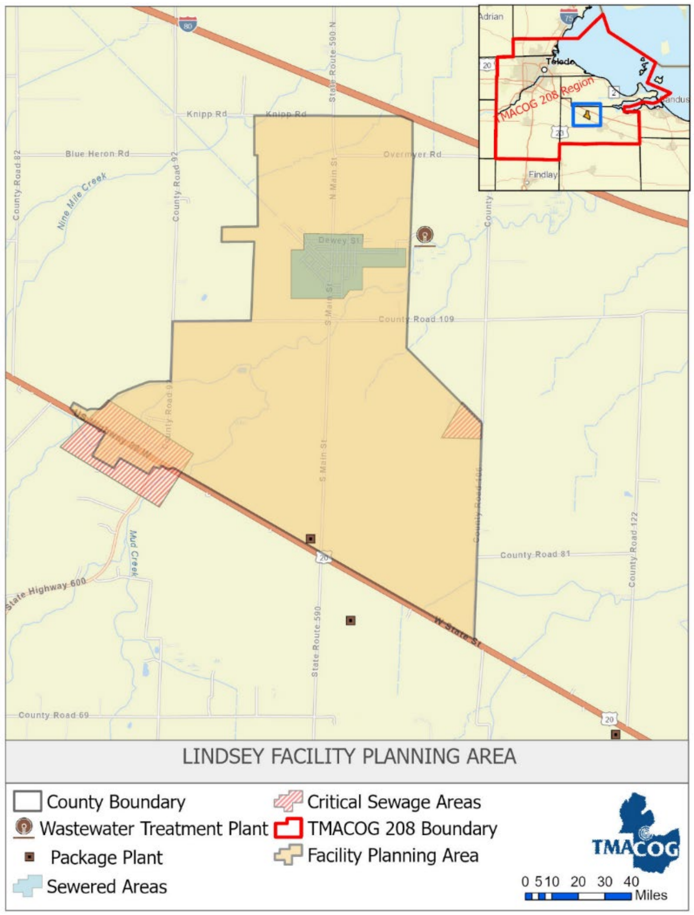


Figure 5 - 28: Lindsey Facility Planning Area

Table 5 - 70: Lindsey Area Population

Area	Total Population
Lindsey, entire jurisdiction	457
Washington Township, entire jurisdiction*	2,315
Total	**2,772**

*only part of this jurisdiction is within the FPA boundary.

Source: the U.S. Census 2020 decennial census

Present Facilities

The Lindsey treatment plant is an extended aeration facility with an average daily capacity of 0.215 mgd and a peak hydraulic capacity of 835,000 gpd; the plant uses tertiary sand filters. In 2003, chlorine disinfection of final effluent was replaced by an ultraviolet system. The plant receives about 20,000 gpd average during very dry weather, but has spiked as high as 874,000 gpd, a flow rate that occurred on April 25, 2011 following a 1.3 inch rainfall during a period of wet weather. Wet weather surges far exceed the capacity of the plant's 100,000 gallon surge tank capacity.

Package plants located in the FPA are listed in Table 5-71.

Table 5 - 71: Package Plants in the Lindsey Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Toledo Edison Headquarters Bldg.[A]	SA-50	Private*	1973	NA: Leaching field	2,000

[A]Status is active
*Facility type is assumed
Note: Data are based on current available data as of April 2019

Issues

Lindsey's NPDES permit cites poor plant performance due to excessive I/I; it is believed that the collection system is susceptible to infiltration because of a high groundwater table. The permit compliance schedule cites collection system surcharges and overflows, hydraulic overloading of the lift stations, and hydraulic overloadings of the wastewater treatment plant.

In early 2008, supervision and licensing sign-off responsibility for the Lindsey WWTP was transferred to a licensed WWTP operator from the Sandusky County Sanitary Engineering Department. Lindsey's WWTP operating results have improved since the transfer. In 2019, sign off responsibility was transferred back to the village.

Smoke testing was conducted in November 2007 and identified an I/I source. A program of storm sewer replacement to eliminate the I/I source was developed, consisting of four annual phases starting in 2009 with a total project cost of $38,290. The four phases include replacement of 923' of storm sewer to eliminate leaks into the sanitary sewer and reduce I/I. The first phase was completed in 2009, the second; which included 350 feet of storm sewer and two catch basins was completed in 2010.

In 2012, the Village took preparatory actions for I/I control. Council selected a consultant to prepare an I/I report. Areas where residential sewers should be televised to locate infiltration have been identified. In September 2012, an inflow source due to a sinkhole was eliminated.

In 2013, Ohio EPA issued findings and orders for the Village to address I/I problems, starting with preparation of a General Plan. In March 2015, the General Plan was in the review/response process of Ohio EPA and the Village's consultant.

Hessville

Hessville is an unincorporated, unsewered town near Lindsey. Houses are served by septic systems, many of which do not have functioning leaching fields. As a result, local streams are polluted by septic tank effluent. Hessville is considered a *Critical Sewage Area* by the Sandusky County Health Department.

The *Lindsey Facilities Plan* cites water quality samples that supported including Hessville in the Lindsey FPA. Samples were collected in September 1980: there was one sample from Fred Paul Ditch showing 2 ppm BOD and >500,000 fecal coliform; and one from Muddy Creek with a 3 ppm BOD and 129,000 fecal coliform. Five additional samples were taken from local tiles, all showing at least 500,000 fecal coliform. These data are too old to be legally enforceable today, but they indicate a pollution problem that is unlikely to have improved since 1980.

The *Lindsey Facilities Plan* recommended sewering Hessville and building an interceptor to Lindsey for treatment. This portion of the project was not built because it would have resulted in user rates that were too high, even with a 75% grant. Substantial financial assistance and/or a lower-cost treatment facility will be necessary to serve Hessville. Lindsey's extraneous flow issues would need to be resolved before accepting the additional flow from Hessville. Ohio EPA has not issued orders to Sandusky County to install sewers for Hessville. Until the I/I problem with the Lindsey collection system is solved, the plant may not have capacity available to serve Hessville.

Future Needs

The Sandusky County Health Department has recommended that a sanitary sewerage system to serve Hessville be built. The Lindsey WWTP was designed with capacity to serve the town, but may be unable to accept the additional flows until the Village's I/I issues are solved. For Hessville sewers, financial assistance will be required. Sandusky County should prepare a General Plan to evaluate options and lay out a financing plan.

The entire collection system was grouted in 1995 to reduce extraneous flows, but the system continues to have problems with extraneous flows, as noted in the NPDES permit compliance schedule. The schedule calls for an I/I reduction plan, which was submitted to Ohio EPA in 2013 and revised in 2014. Among the actions called for:

Enact ordinances to require all new sewer construction to meet Ohio EPA standards.

A plan for determining extraneous flow and illegal connections, and flow/velocity monitoring at strategic points in the sewer system.

Schedule for I/I reductions projects, including televising sewer lines, dye/smoke testing, and/or home inspections for sump pump connections to the sanitary sewer.

Completion of I/I reduction work to reduce peak wet weather flows to wastewater treatment plant within 5 years of the effective date of the NPDES permit.

The Village conducted sewer system investigations in 2013-14 to determine I/I sources and plan improvements to exclude extraneous flows. Investigations included sewer surveys, smoke testing, and manhole evaluation. Smoke testing in 2013 found 10 properties with I/I sources compared with 25 in 2006 testing. A survey found widespread use of sump pumps. Where the pumps discharged was usually noted clear, but it was found that the number of existing pumps, if going to the sanitary sewers, would overwhelm the pump station and WWTP capacities. As of 2020 all know sump pumps have been removed.

A remediation plan has been submitted to Ohio EPA. It includes rehabilitation of manholes, slip lining of sanitary sewers, service laterals, tiles and other issues, and removal of sump pumps from the sanitary system. The first phase of the Village's I/I project is slated to start in spring 2018, and the Village has received funding for the second phase that is slated for 2018. The Village has confirmed that all (182) sump pumps do not enter the sewer system.

Phase I to start in March 2018.

Phase 2 to be bid in July 2018 and to be completed by end of 2018.

Phase 1 completed 2018

Phase 2 completed 2019

Upgrades to the WWTP are expected to begin in 2018 if funding is still available.

2 of 4 WTP clarifiers to be replaced in 2018. This will provide additional storage capacity.

2 Clarifiers replaced in 2020

2 Clarifiers to be replaced in the possible near future

This plan supports financial assistance for the Village of Lindsey to assist with its I/I reduction measures.

The capital improvement plan for the Lindsey FPA is shown in Table 5-72.

Table 5 - 72: Lindsey FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2022	2023	2024	2025	2026	2027	Future
WWTP Clarifier (2)	Village	$300,000	$300,000						
		$300,000							

Vickery Facility Planning Area

Designated Management Agency Responsibilities:

- **Sandusky County**: Responsible for planning public sewerage system; and will own and operate it, if and when built.

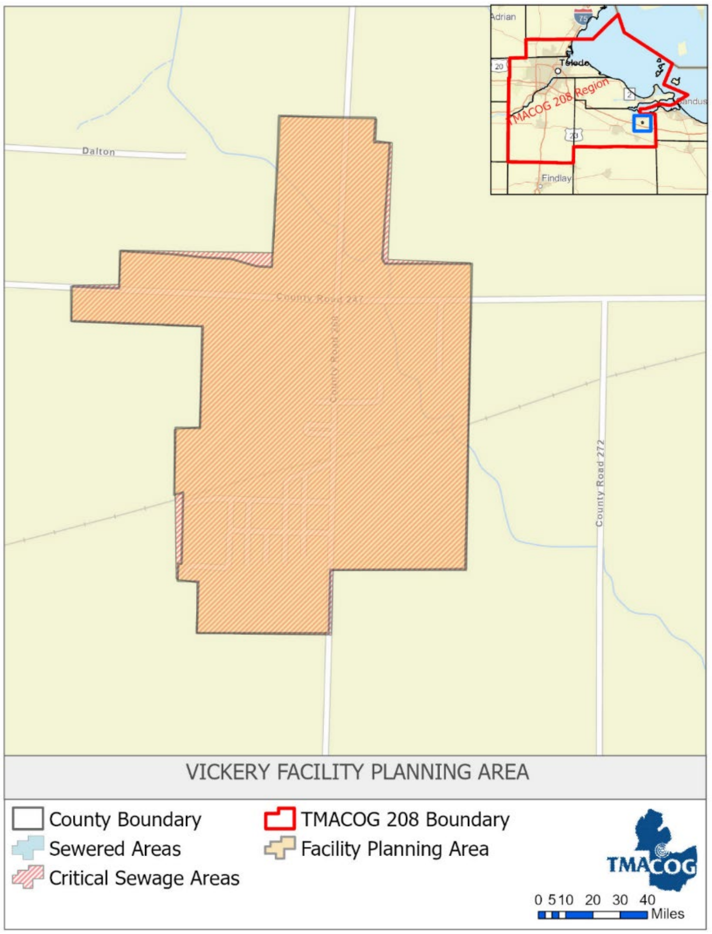


Figure 5 - 29: Vickery Facility Planning Area

Table 5 - 73: Vickery Area Population

Area	Total Population
Townsend Township, entire jurisdiction*	1,523

*only part of this jurisdiction is within the FPA boundary.
Source: the U.S. Census 2020 decennial census

Present Facilities

Vickery is an unincorporated community of about 85 houses in Townsend Township. There is no public sewerage system; sewage treatment is provided by individual septic systems. Soils in this area belong to the Toledo-Fulton Association, which are mostly level, very poorly to somewhat poorly drained clays. Suitability for sewage disposal is poor. Vickery is considered a *Critical Sewage Area* by the Sandusky County Health Department.

Issues

The concentration of homes using septic systems on small lots and in soils poorly suited for leaching fields, makes Vickery likely to need a public sewerage system. Ohio EPA conducted sampling in 2000 which indicated failed septic systems.

Future Needs

A sewerage system will be needed in Vickery eventually. There are several communities in Sandusky County that involve larger populations and bigger problems, and they should receive higher priority. There are no projects planned at the present.

Wightman's Grove Facility Planning Area

Designated Management Agency Responsibilities:

- **Sandusky County**: Owns and operates sanitary sewers and facilities within the unincorporated areas of this planning area.

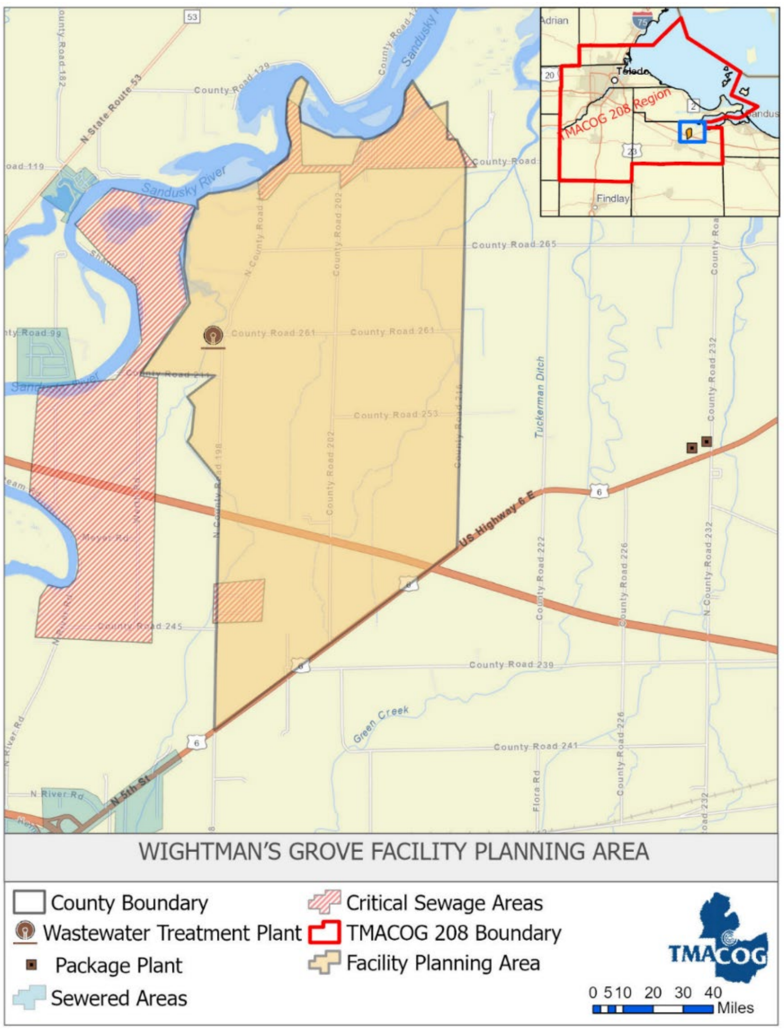


Figure 5-31: Wightman's Grove Facility Planning Area

Table 5 - 74: Wightman's Grove Area Population

Area	Population
Riley Township, entire jurisdiction*	1,214

Sandusky Township, entire jurisdiction*	3,551
Total	4,765

*only part of this jurisdiction is within the FPA boundary.
Source: the U.S. Census 2020 decennial census

Present Facilities

The county completed construction of wastewater facilities and collection system in 2022 and is in the process of connecting structures in the Wightman's Grove area. It is estimated that of the original 93 residences identified in 1986, only 54 residences remain.

Issues

In addition to Wightman's Grove area, the FPA includes areas near Memory Marina are still in the Wightman's Grove Critical Sewage Area. This area is considered Phase 2 by the county and will be served with wastewater facilities completed in 2022. The Barkshire Hill subdivision in Riley Township, which is also designated as a Critical Sewage Area is considered Phase 3 by the county.

Future Needs

Previous future needs are being resolved as work is currently ongoing to remediate the issues.
The capital improvement plan for the Wightman's Grove FPA is shown in Table 5-75.

Table 5 - 75: Wightman's Grove Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2022	2023	2024	2025	2026	2027	Future
Wightman's Grove Ph. 2 (Memory Marina)	Sandusky County	$1,000,000		1,000,000					
Wightman's Grove Ph. 3 (Barkshire Subdivision)	Sandusky County	$2,500,000			2,500,000				
		$3,500,000							

Woodville Facility Planning Area

Designated Management Agency Responsibilities:

- **Village of Woodville**: Owns and operates wastewater treatment facilities, and collection system within the corporate limits.
- **Sandusky County:** Will own and operate collection system, if and when built, in Sandusky County unincorporated areas, connecting to Village system for treatment services.

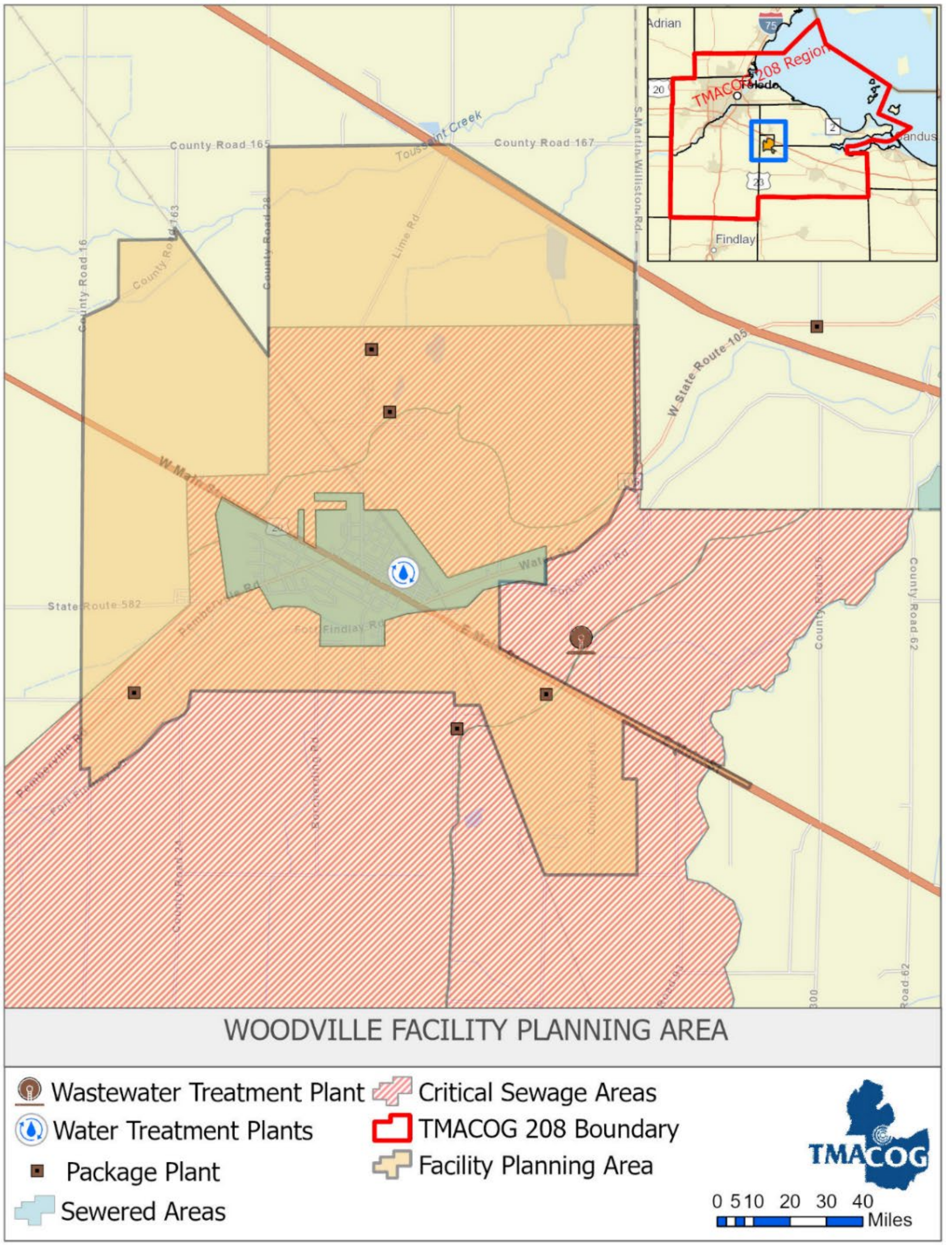


Figure 5 - 30: Woodville Facility Planning Area

Table 5 - 76: Woodville Area Population

Area	Population
Woodville, entire jurisdiction	2,006
Woodville Township, entire jurisdiction*	3,303
Total	5,309

*only part of this jurisdiction is within the FPA boundary.
Source: the U.S. Census 2020 decennial census

Present Facilities

The Village of Woodville owns and operates an aerated lagoon WWTP that has an average daily capacity of 0.3 mgd and peak capacity of 1.0 mgd. Ohio EPA data shows an average flow of 0.454 mgd during the period of 2004-2009, and a peak flow of 1.45 mgd during the period of 2016-2017. The aerated lagoon was constructed in 2000 and stores stormwater for treatment.

In 2011 and 2012, a three-phase project to separate the combined sewer system was constructed. New sanitary sewers were installed. In addition, a lift station was replaced to improve reliability and alleviate confined space entry safety issues. The original combined sewers were converted to a separate storm drainage system by eliminating cross-connections with the sanitary. In 2014, the Village's main lift station was replaced as part of the sewer separation project. This lift station directs all Village sanitary flows to the WWTP. The total sewer separation project cost, including the lift station replacements, is anticipated to be approximately 10.87 million.

Package plants located in the Woodville FPA are listed in Table 5-77.

Table 5 - 77: Package Plants in the Woodville Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Area Aggregates / Olen[A]	SA-54	Private	1974	2IJ00097	1,500
Graymont Dolime[A]	SA-57S	Private*	1975	2IJ00040	2,000
Martin Marietta[A]	SA-57N	Private	1975	2IJ00040	5,000
Predator Trucking[A]	SA-63	Private	1992	2PR00149	2,000

[A]Status is active

*Facility type is assumed

Note: Data are based on current available data as of April 2019

Issues

Before separation of the Village's combined sewers, the Woodville WWTP experienced permit violations on suspended solids and fecal coliform levels due to wet weather flow surges with monthly flows as high as 0.645 mgd. Construction of separate sanitary sewers was completed in 2012, and will lead to eliminating all 17 CSO regulators once all properties are tapped to the new system and post-construction monitoring is performed. In March 2013, approximately 50% of services had been connected.

The Village of Woodville has experienced upsets with the WWTP in the past years through current daily operations. They have entered into an Administrative Order of Consent with the EPA and goals this have include determining the I & I in our collection system. During rain events the flows to the sewer plant rated at 0.3 MGD can increase to over 1.3 MGD surcharging the plant and allowing the process to be upset. Recovery takes 5 to 10 days back into a reasonable range. They are in the process of an I & I study with the assistance of ORWA, Ohio Rural Water, monitoring flows at various locations within the Village to determine illegal or cross-connections into the sanitary sewer. This study has been underway for 2 months in the summer of 2022 and the data to date indicates storm sewers may be connected as well as possible sump pumps for individual properties.

In addition to the I & I study they need to begin plans for a filtering unit to be placed at the end of the treatment works prior to discharging. This plan is required to be implemented and operational by the end of 2026.

Future Needs

- According to Woodville's Long-Term Control Plan (LTCP) approved by Ohio EPA in May 2019. Separation of the Village's combined sewers has been completed. Five remaining outfalls have sanitary discharges yet to be removed and/or need further evaluation to confirm closure. These locations are now considered sanitary sewer overflows (SSOs).

- The Village shall report on post-construction compliance monitoring to determine whether the outfalls can be eliminated.

This Plan supports financial assistance for the Village of Woodville to implement its LTCP. The capital improvement plan for the Woodville FPA is shown in Table 5-78.

Table 5 - 78: Woodville FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs					
		2022	2023	2024	2025	2026	2027	Future
Filtering Unit	Woodville							X
I&I Remediation	Woodville							X

WOOD COUNTY FACILITY PLANNING AREAS

Last Updated, 2025

Bloomdale-Bairdstown Facility Planning Area

The Bloomdale-Bairdstown Facility Planning Area (FPA) is a designated region within the Wood County area where wastewater management, including sewage treatment and disposal, is planned and coordinated (Figure 5-31). The Bloomdale-Bairdstown FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. The Bloomdale-Bairdstown FPA is managed by Northwestern Water and Sewer District (NWWSD) which is represented by Designated Management Agencies. The responsibilities of each of these agencies are outlined below:

Designated Management Agency Responsibilities:

- **Northwestern Water and Sewer District:** The Villages of Bloomdale and Bairdstown are members of Northwestern Water and Sewer District. The District is responsible for planning public sewerage systems, which it owns and operates.

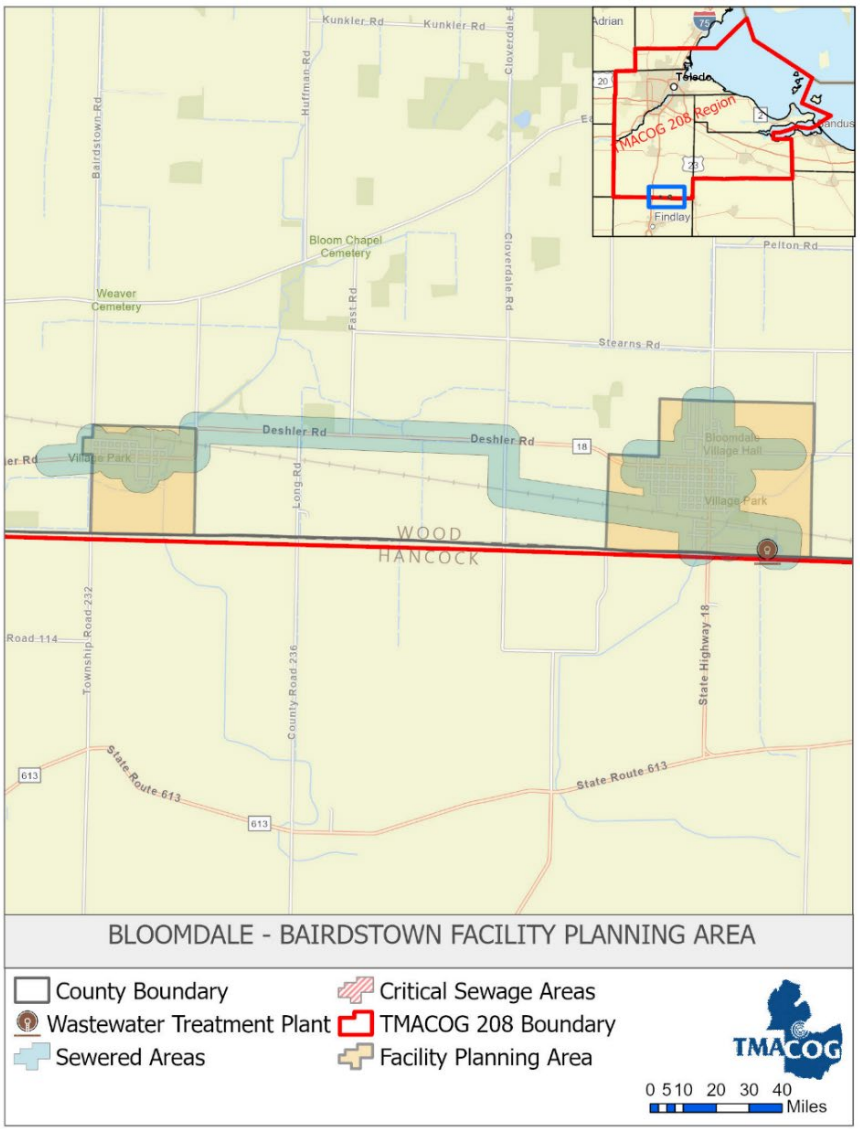


Figure 5 - 31: Bloomdale-Bairdstown Facility Planning Area

Table 5 - 79: Bloomdale-Bairdstown Area Population

Area	Population
Bloomdale, entire jurisdiction	665
Bairdstown, entire jurisdiction	115

Source: the U.S. Census 2020 decennial census

Present Facilities

The 2017 Bloomdale/Bairdstown Wastewater Treatment Plant is an Activated Sludge System which includes an oxidation ditch, final settling tanks, ultraviolet disinfection and aerated sludge treatment and storage. The sludge treatment provides disposal options for both land application and landfill. Average daily design flow is at 0.100 mgd and the peak flow is at 0.300 mgd. The average monthly flow in 2023 to 2024 was 0.085 mgd.

The Bloomdale small diameter gravity sewer collection system was constructed in 1991 and the original wastewater plant, which was also constructed in 1991, has been replaced with the new treatment plant that now includes the Village of Bairdstown.

Northwestern Water and Sewer District constructed a conventional gravity sewer collection system in 2017 to serve the Village of Bairdstown. The gravity sewers flow to a main pump station located on State Route 18, just south of the railroad tracks. A second pump station was constructed to deliver sanitary flow to the Bloomdale sewer collection system. As of March 2017, all of Bairdstown is sewered and lateral hook ups to homes are complete.

The Bairdstown sewer system cost $1,985,438 and the joint WWTP cost $3,020,000. The project was funded by Community Development Block Grant (CDBG) program and U.S. Department of Agriculture (USDA).

New Subdivisions

It is the policy of the Plan that all new residential subdivisions that are required to be plated under Wood County subdivision regulations, septic tanks or individual household sewage treatment systems for plated subdivisions of more than five (5) lots shall not be permitted within the FPA boundary. New plated subdivisions shall connect to public sewers and be served by the Bloomdale-Bairdstown wastewater treatment plant.

Future Needs

- This Areawide Water Quality Management Plan supports grant funding and other financial assistance to achieve the future goals for the Bloomdale-Bairdstown FPA.
- Elimination of wet weather flow through sewer and lateral rehabilitation.

The capital improvement plan for the Bloomdale-Bairdstown FPA is shown in Table 5-80.

Table 5 - 80: Bloomdale-Bairdstown FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2022	2023	2024	2025	2026	2027	Future
Bloomdale Sanitary Sewer I/I Removal	Northwestern Water and Sewer District	**$10,000**							$100,000
		$100,000							

Bowling Green Facility Planning Area

The Bowling Green Facility Planning Area (FPA) is a designated region within the Bowling Green area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Toledo (Figure 5-32). The Bowling Green FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by several communities which are represented by Designated Management Agencies. The responsibilities of each of these agencies are outlined below:

Designated Management Agency Responsibilities:

- **City of Bowling Green**: Owns and operates wastewater treatment facilities, and collection system within the corporate limits.
- **Village of Portage:** Owns the wastewater collection system within the corporate limits; maintenance is conducted by Northwestern Water and Sewer District under contract with the Village.
- **Northwestern Water and Sewer District:** Owns and operates collection systems outside the corporate limits, connecting to the Bowling Green municipal wastewater collection system for treatment services.

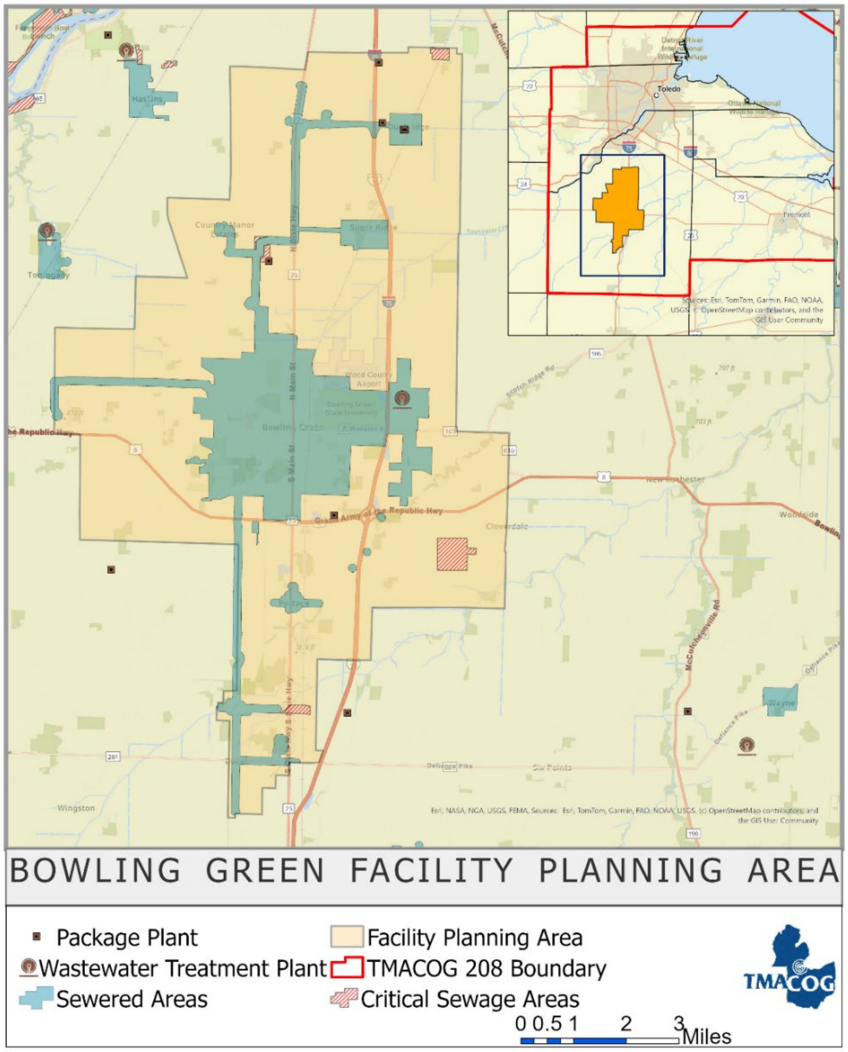


Figure 5 - 32: Bowling Green Facility Planning Area

Table 5 - 81: Bowling Green Area Population

Area	Population
Bowling Green, entire jurisdiction	30,808
Portage, entire jurisdiction	398
Center Township, entire jurisdiction*	1,140
Liberty Township, entire jurisdiction*	1,690
Plain Township, entire jurisdiction*	1,625
Portage Township, entire jurisdiction*	1,558

*only part of this jurisdiction is within the FPA boundary.

Source: U.S. Census 2020 decennial census.

Present Facilities

Bowling Green built its current WWTP in 1982. It is an activated sludge plant facility with tertiary disk filters (2009), auto-thermophilic aerobic digestion (ATAD 2005), ultraviolet disinfection (2010), and a septage receiving station (2005). The City of Bowling Green has developed and implemented an industrial wastewater pretreatment program since 2006. In 2018, the treatment plant expanded the expanded the grit removal capacity to 30 mgd.

The plant uses a centrifuge to dewater Class A biosolids. Currently, a local landscape contractor creates commercial topsoil using the biosolids. The plant has an average design capacity of 10.0 mgd, with a peak capacity of 20 mgd. In 2009 the tertiary sand filters were replaced with 30 mgd cloth disc filter units; a 30 mgd ultraviolet disinfection system was installed in 2010. Ohio EPA data shows an average flow of 5.856 mgd and a peak flow of 29.881 mgd during the period of 2010-2013.

The Bowling Green system includes combined sewers serving an area of 1,940 acres (out of about 5,400 acres for the whole service area). When the wastewater plant was built, an underground combined sewage overflow retention tank was included. The retention tank substantially reduces but does not completely eliminate overflows. Portage was included in the Bowling Green FPA and was accounted for in sizing the treatment plant. Portage installed sanitary sewers and tapped into the system in 1991.

The east side of the SR 582/SR 25 intersection is served by the Northwestern Water and Sewer District (District) system. It connects to the system via force main following SR 25, Union Hill, and Brim Roads with treatment provided by Bowling Green.

Rudolph, an unincorporated community of about 200 residences in Liberty Township, is served by the District. It connects to the system via force main following Rudolph Rd with treatment provided by Bowling Green. The Rudolph sanitary sewer system was completed in 2003 at a cost of $2,208,270. The project received CDBG and USDA grants totaling $1,188,000; the balance of the capital costs will be paid by residents through rates.

There are several package sewage treatment plants in the Bowling Green FPA, two of which are 20,000 gallons per day or larger. The plant serving the Maurer Trailer Park has been identified as a critical sewage area. A recent court decision did not require the Park to be publicly sewered.

The Wood County Landfill is served by the District via force main along Poe Rd with treatment provided by Bowling Green.

Package plants in the FPA are listed in Table 5-82.

Table 5 - 82: Package Plants in the Bowling Green Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
13611 Klopfenstein Road[A]	WO-105	Private*	1972		1,500
Elmview C.S.A. Apartments (East)[A]	WO-43E	Private*			1,500
Elmview C.S.A. Apartments (West)[A]	WO-43W	Private			1,500
Industrial Services[A]	WO-04	Private*			1,500
Maurer Trailer Park[A]	WO-64	Private	1967, 1969, 2010	2PY00005	30,000
Principle Business Enterprises, Inc.[A]	WO-45	Private*	1976, 1978	No Disch.	1,500

[A]Status is active

*Facility type is assumed

Note: Data are based on current available data as of April 2019

Issues

The FPA covers part of the SR 25 / I-75 corridor. The Wood County Comprehensive Plan identifies this area for employment opportunities and is therefore included in the FPA with a potential for requiring future service. The area is presently rural with no public sewerage facilities in this area, active package plants, or unsewered developed areas.

Combined Sewer Overflows

As noted above in "Present Facilities," the Bowling Green sewerage system includes an overflow retention tank. In 2006, Ohio EPA required Bowling Green to submit a Long-Term Control Plan (LTCP) to reduce overflows further.

In January 2007, the City of Bowling Green filed its CSO LTCP with the Ohio EPA and submitted a revised plan on or about June 1, 2007.

1. Although the LTCP was submitted by the Ohio EPA's deadline, staff wasn't convinced that the plan left no stone unturned in trying to not only eliminate CSOs, but also addressing wet and damp basement issues for local residents and businesses. As a result, staff began an investigation that included soliciting ideas from multiple engineering firms, reviewing technical documents on the subject and seeking solutions other communities have effectively employed.

   The result of this investigation was staff's development of the City of Bowling Green Comprehensive Wastewater Strategy. This document details the requirements of the City's 2006 NPDES permit relating to a CSO LTCP and Sanitary Sewer Overflow (SSO) reporting requirements and also lists goals and objectives for a long-term wastewater strategy for the City.

2. On January 24, 2008, City staff met with Northwest District and Central District Ohio EPA staff to solicit the Agency's reaction to and input on the proposed Comprehensive Wastewater Strategy.

   Subsequently to this meeting, the Ohio EPA drafted an NPDES permit modification, effective March 1, 2008, that required upgrades of the clarifiers and the tertiary filters; upgrades of the ultraviolet disinfection system; and reports on characterization of the Wastewater Treatment Plant's increased capacity, characterization of the Storm Water Overflow Holding Basin's capacity, and an evaluation of CSO characteristics including overflow occurrence and volume. These steps were all completed by 2010. The remaining step is an evaluation of the need for additional storage at the Wastewater Treatment Plant to reduce CSO events to four, two, and zero occurrences per year. This evaluation will depend on the effects of the increased flow capacity from the Poe/Mercer Rd pumping station improvements, completed in 2013.

Critical Sewage and Ordered Areas

Several areas in the Bowling Green FPA have been identified as Critical Sewage Areas by the Wood County Health Department and/or Ohio EPA. Additionally, in 2010 Ohio EPA ordered four new areas to receive public sanitary sewers and they should be installed per Ohio EPA schedules.

- Kramer/Huffman Roads Area: an Ohio EPA ordered area with failing septic systems that includes about 28-33 houses. The District studied serving the area either by a sewer extension to Bowling

Green, and on-site treatment solutions. Both were found to be financially infeasible. Funding applications are submitted on a regular basis to help make the project feasible. The existing systems will be managed under Health Department operation and maintenance requirements.

- **Sugar Ridge/Mercer Roads Area:** an unincorporated community with the adjacent Mercer Road including 75 residences in Center and Middleton Townships. It is about 3.0 miles north of Bowling Green between I-75 and SR 25. The original town of Sugar Ridge lies between the railroad crossing at Sugar Ridge Road on the west and I-75 on the east. More recent development has spread west along Sugar Ridge Road and north and south along Mercer Road. Sanitary sewers were constructed in 2023 to address this Ordered Area.

Maurer Mobile Home Park: a mobile home park designated as a Critical Sewage Area. It is located just north of Bowling Green and is served by a package plant that discharges to a drainage tile on SR 25. In 2004, this wastewater treatment plant was subject to enforcement action by the Ohio Attorney General. Future changes will be per the court settlement on Ohio EPA's enforcement action.

- **Dunbridge:** an unincorporated community, located at Dunbridge Road and SR 582. There are four package plants in or near the town. Individual residences are served by septic systems. OEPA has investigated the area, issued orders to construct sewers. Sewers are under construction and should be completed by the end of 2025. NWWSD is currently completing this project. This area was under order by the Ohio EPA after investigation conducted as result of WCHD referral.
- **Dowling:** an unincorporated community, located at Dowling Road and Conrail tracks between Dunbridge and Carter Roads. Residences are served by septic systems. Dowling is not under orders to construct sewers. The community is split between the Bowling Green and Perrysburg FPAs. Dowling is identified as a Critical Sewage Area
- **Mermill:** There is no existing documentation of sewage problems in Mermill, which has about 30 residences. No stream testing data is available, but septic system failures are very common in Wood County with houses of similar age and size on similar soils. It may be feasible to install sewers and connect to Bowling Green through Rudolph via force main.

208 Policies for New Subdivisions in Bowling Green FPA

It is the policy of the Plan that all new residential subdivisions that are required to be plated under Wood County subdivision regulations, septic tanks or individual household sewage treatment systems for plated subdivisions of more than five (5) lots shall not be permitted within the FPA boundary. New plated subdivisions shall connect to public sewers and be served by the Bowling Green wastewater treatment plant.

Future Needs

This Plan supports financial assistance for Bowling Green's wastewater facility improvements.

- The District completed a General Plan to eliminate unsanitary conditions for the Huffman / Kramer Roads area.. However, the system cost has been found not to be affordable. The residents have failing systems with no viable drainage for NPDES or on site sewage treatment systems. Wood County Health Department is currently working with the Wood County Engineer in Liberty Township, for replacement of a storm line to service small lots with several failing systems in the Oak St./Williams St./State Rte. 25 area. This would allow functioning sewage treatment systems to be installed.

The capital improvement plan for the Bowling Green FPA is shown in Table 5-83.

Table 5 - 83: Bowling Green FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2025	2026	2027	2028	2029	2030	Future
Huffman / Kramer general plan, sewers	Northwestern Water and Sewer District	$6,000,000							**$6,000,000**
Dunbridge Area Sewer	Northwestern Water and Sewer District	$12,000,000	$12,000,000						**$2,500,000**
		$18,000,000							

Bradner Facility Planning Area

The Bradner Facility Planning Area (FPA) is a designated region within the village of Bradner where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Village of Bradner (Figure 5-33). The Bradner FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by several communities which are represented by Designated Management Agencies. The responsibilities of each of these agencies are outlined below:

Designated Management Agency Responsibilities:

- **Village of Bradner**: Owns and operates wastewater treatment facilities, and collection system within the corporate limits.
- **Northwestern Water and Sewer District:** Will own and operate portions of the collection system in unincorporated areas of Wood County, connecting to the Bradner system for treatment services.
- **Sandusky County**: Will own and operate, if and when built, portions of the collection system in unincorporated areas of Sandusky County, connecting to the Bradner system for treatment services.

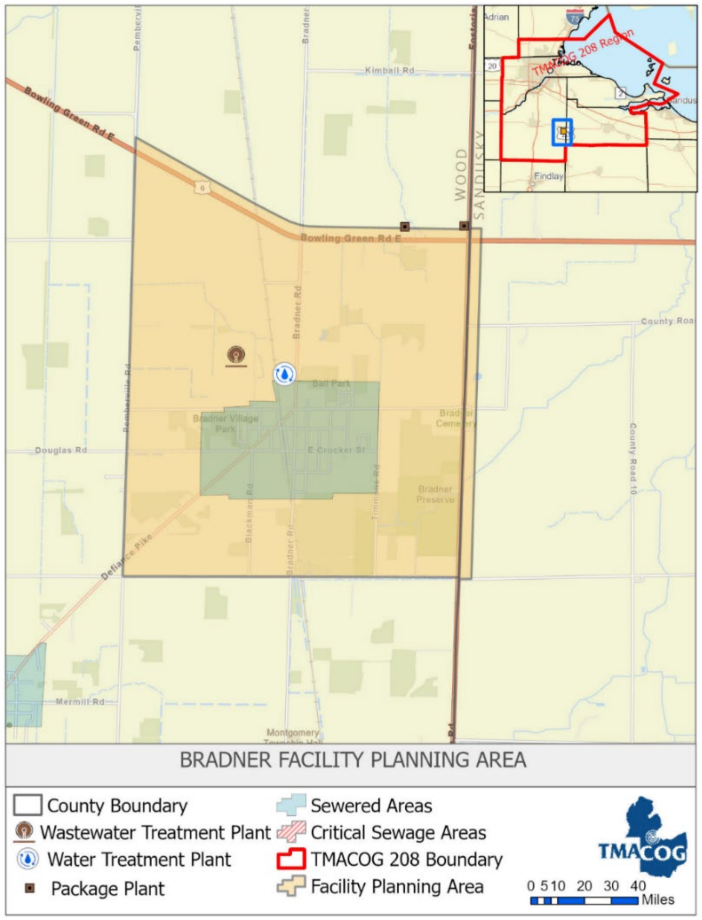


Figure 5 - 33: Bradner Facility Planning Area

Table 5 - 84: Bradner Area Population

Area	Population
Bradner, entire jurisdiction	971
Montgomery Township, entire jurisdiction*	4,157
Madison Township, entire jurisdiction*	3,887
Scott Township, entire jurisdiction*	1,330

*only part of this jurisdiction is within the FPA boundary
Source: U.S. Census 2020 decennial census.

Present Facilities

The Bradner WWTP is a three-cell lagoon facility that was built in 1988. The plant is a controlled discharge lagoon, meaning it does not discharge continuously, nor does it discharge every day. The system uses conventional gravity sewers. The design capacity is 0.13 mgd; Ohio EPA data shows an average flow of 0.238 mgd, and a peak flow of 0.274 mgd on days where discharges occurred during the period of 2004-2009. Daily, the average discharge was 0.71 mgd. In 2009, Bradner received 75% American Recovery and Reinvestment Act (ARRA) funding on a $389,000 upgrade for five lift stations.
Package plants located in Bradner the FPA are listed in Table 5-83.

Table 5 - 85: Package Plants in the Bradner Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Ports Petroleum Fuel Mart #767[A]	WO-103	Private	1987	2PR00190	4,000
Twin Maples MHP[A]	WO-106	Private		2PY00069	5,000
US 6/23 Retail Sales[A]	SA-21	Private	1973	2PR00202	5,000

[A]Status is active

Note: Data are based on current available data as of April 2019

New Subdivisions

It is the policy of the 208 Plan that all new residential subdivisions that are required to be plated under Wood County subdivision regulations, septic tanks or individual household sewage treatment systems for plated subdivisions of more than five (5) lots shall not be permitted within the FPA boundary. New plated subdivisions shall connect to public sewers and be served by the Bradner WWTP.

Future Needs

There is no future need during 2025 update.

Custar/Milton Center Facility Planning Area

The Custar/Milton Facility Planning Area (FPA) is a designated region within the Custar/Milton area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Village of Custar/Milton (Figure 5-34). The Custar/Milton FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by Northwestern Water and Sewer District which is represented by Designated Management Agencies. The responsibilities of each of these agencies are outlined below:

Designated Management Agency Responsibilities:

- **Northwestern Water and Sewer District:** both the Villages of Custar and Milton Center, and Milton Township are members of Northwestern Water and Sewer District. The District is responsible for the planning, ownership and operations of public sewage systems in both incorporated and unincorporated areas.

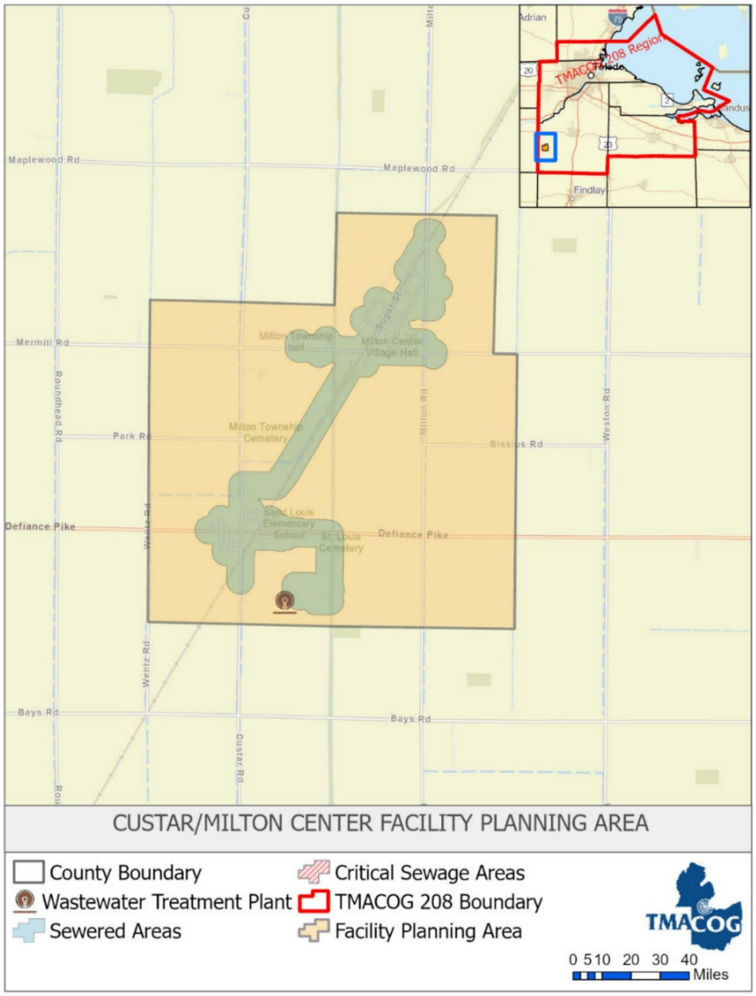


Figure 5 - 34: Custar/Milton Center Facility Planning Area

Table 5 - 86: Custar/Milton Center Area Population

Area	Total Population
Custar, entire jurisdiction	178
Milton Center, entire jurisdiction	137
Milton Township, entire jurisdiction*	929
Estimates within the FPA boundary	

*only part of this jurisdiction is within the FPA boundary
Source: U.S. Census 2020 decennial census.

Present Facilities

A wastewater collection and treatment system consisting of conventional gravity sewers, a pump station, and a non-aerated facultative controlled discharge lagoon was completed in the Village of Custar in 2006. The plant began serving the Villages of Custar in 2007 and Milton Center in 2008. The wastewater lagoon has a design flow of 0.05 mgd. The peak outfall discharge in 2023-2024 period was 0.105 mgd.

New Subdivisions

It is the policy of the Plan that all new residential subdivisions that are required to be plated under Wood County subdivision regulations, septic tanks or individual household sewage treatment systems for plated subdivisions of more than five (5) lots shall not be permitted within the FPA boundary. New plated subdivisions shall connect to public sewers and be served by the Custar wastewater treatment plant.

Future Needs

The current wastewater systems serving both Villages should provide adequate capacity to handle the wastewater demands for the foreseeable future.

Table 5 - 87: Custar/Milton Center FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2025	2026	2027	2028	2029	2030	Future
Lagoon Sludge Removal	NWWSD	$25,000				$25,000			

Cygnet/Jerry City Facility Planning Area

The Cygnet/Jerry Facility Planning Area (FPA) is a designated region within the Cygnet/Jerry area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Cygnet/Jerry (Figure 5-35). The Cygnet/Jerry FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by Northwestern Water and Sewer District which is represented by Designated Management Agencies. The responsibility of this agency is outlined below:

Designated Management Agency Responsibilities:

- **Northwestern Water and Sewer District:** Owns and operates the collection system in the Village of Jerry City, the Village of Cygnet, and unincorporated areas.

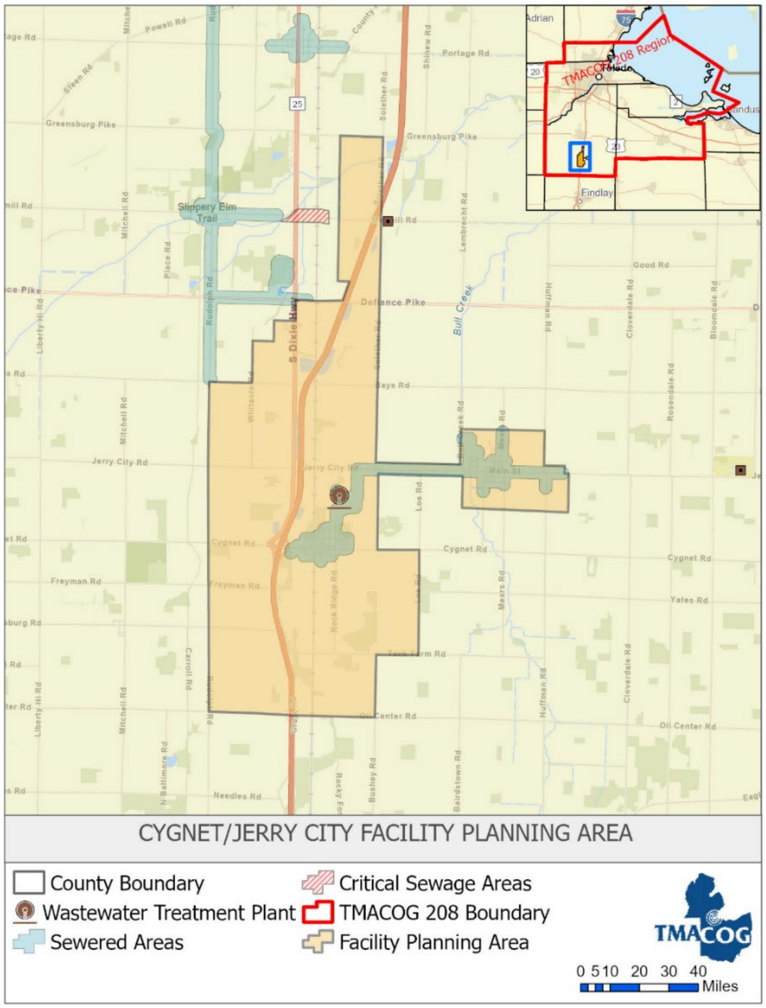


Figure 5 - 35: Cygnet/Jerry City Facility Area

Table 5 - 88: Cygnet/Jerry City Area Population

Area	Total Population
Cygnet, entire jurisdiction	543
Jerry City, entire jurisdiction	454
Bloom Township, entire jurisdiction*	2,513
Henry Township, entire jurisdiction*	4,079
Liberty Township, entire jurisdiction*	1,690
Portage Township, entire jurisdiction*	1,558

*only part of this jurisdiction is within the FPA boundary.

Source: the U.S. Census 2020 decennial census.

Present Facilities

The Cygnet/Jerry City WWTP is a lagoon facility with an average daily capacity of 0.09 mgd. There are 247 customers in Cygnet and 214 in Jerry City. The plant was designed to allow 50% growth in both towns. Ohio EPA data shows an average flow of 1.502 mgd, and a peak flow of 1.700 mgd during the period of 2004-2007. Peak discharges from the lagoons averaged 0.106 mgd in 2023-2024. The Cygnet sewer system was completed in 1995, and Jerry City's in 1996; both systems are conventional gravity sewer systems. Each Village pumps its sewage to the treatment plant at a main pump station. In 2014, flow meters were added to both main pump stations.

In 2021-2022, the three sewer pump stations in Cygnet were replaced with new submersible stations and a new force main was constructed to make the system operate more efficiently by the elimination of double pumping.

Issues
The Cygnet/Jerry City FPA covers part of the corridor U.S. 25 / I-75. The Wood County Comprehensive Plan identifies this area for employment opportunities and is therefore included in the FPA with a potential for requiring future service. The area is presently rural with no public sewerage facilities available, active package plants, or unsewered developed areas.

New Subdivisions
It is the policy of the Plan that all new residential subdivisions that are required to be platted under Wood County subdivision regulations, septic tanks or individual household sewage treatment systems for platted subdivisions of more than five (5) lots shall not be permitted within the FPA boundary. New platted subdivisions shall connect to public sewers and be served by the Cygnet wastewater treatment plant.

Future Needs
Capital improvement needs include the replacement of each pump station and the addition of flow meters. The capital improvement plan for the Cygnet/Jerry City FPA is shown in Table 5-89. Residents in the Hammansburg area have requested that sanitary sewers be extended to serve their homes. Approximately 50 homes would be impacted by this project. The costs per home are very high and significant grant funding will be required to allow it to proceed.

Table 5 - 89: Cygnet/Jerry City FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2025	2026	2027	2028	2029	2030	Future
Hammansburg Sanitary Sewer System									$2,000,000

Fostoria Facility Planning Area

Fostoria Facility Planning Area (FPA) is a designated region within the Fostoria area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Fostoria (Figure 5-38). The Fostoria FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by several communities which are represented by Designated Management Agencies. The responsibilities of each of these agencies are outlined below:

Designated Management Agency Responsibilities:

- **City of Fostoria**: Owns and operates wastewater treatment facilities, and collection system within its corporate limits. Own and operates collection system in Hancock County unincorporated areas, connecting to the city system for treatment services.
- **Northwestern Water and Sewer District:** Owns and operates collection system in Wood County unincorporated areas, connecting to the city system for treatment services.
- **Seneca County:** Owns and operates collection system in Seneca County unincorporated areas, connecting to the city system for treatment services.
- **Village of New Riegel:** Seneca County owns and operates the New Riegel collection system, connecting to the Fostoria system for treatment services.

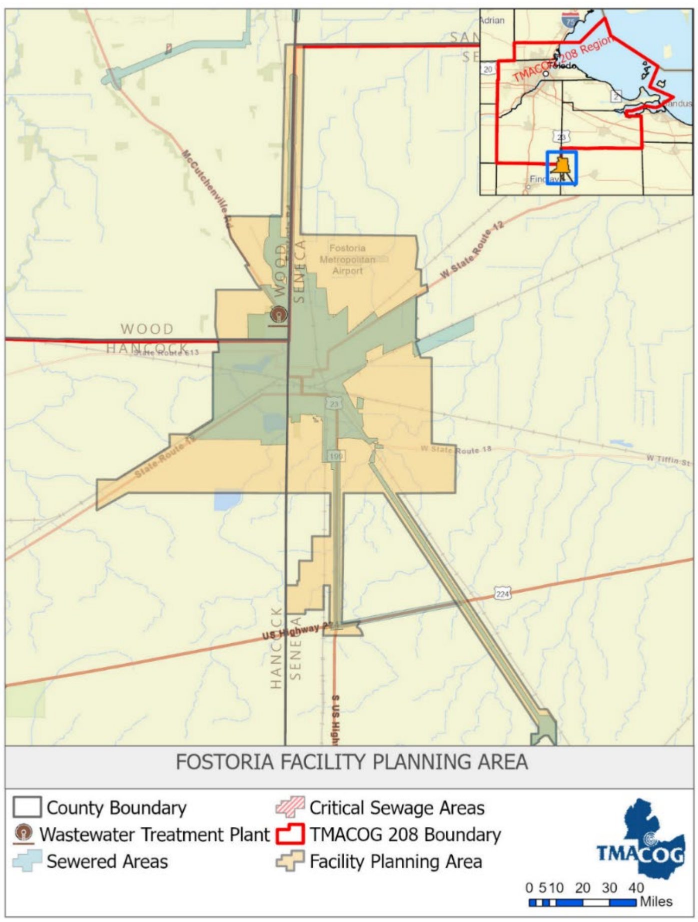


Figure 5 - 36: Fostoria Facility Planning Area

Table 5 - 90: Fostoria Area Population

Area	Population
Fostoria, entire jurisdiction	13,046
Perry Township, entire jurisdiction (Wood County)*	1,568
Washington Township, entire jurisdiction (Hancock County)*	4,353
New Riegel, entire jurisdiction	286
Loudon Township, entire jurisdiction (Seneca County)*	2,246
Jackson Township, entire jurisdiction (Seneca County)*	1,401
Total	**22,900**

*only part of this jurisdiction is within the FPA boundary.
Source: U.S. Census 2020 decennial census.

Present Facilities

The Fostoria WWTP is a primary settling and activated sludge facility that treated an average daily flow of 4.718 mgd in 2024 with a daily maximum flow of 13.179 mgd and a minimum flow of 1.833 mgd. Primary treatment capacity is 12.7 mgd, and secondary treatment capacity is 12.7 mgd. In 2014, the city completed the installation of two new final 100 feet diameter clarifiers. The previous rectangular clarifiers were converted to six additional aeration tanks. Additionally, improvements were made to the flow splitter chamber into the aeration tanks, and the return sludge pump wet well along with the construction of related piping and flow meters. These improvements increased the secondary treatment capacity to 12.7 mgd. Ohio EPA data showed an average flow of 4.500 mgd, and a peak flow of 12.047 mgd during the period of 2011-2015. The plant uses ultraviolet (UV) disinfection of final effluent; sludge is held in an aerated sludge holding tank until it is dewatered by a filter belt press. In 2023, the city completed installation of a new UV treatment system.

In 1994, the City completed a major upgrade and expansion that included increased primary treatment capacity, elimination of the plant bypass, CSO abatement, and construction of a 2.0 mg primary effluent storage lagoon. The total cost for these improvements was $7 million. The lagoon stores primary effluent that the second treatment facilities cannot handle during wet weather. The primary effluent is stored until the plant has the capacity to treat it. The primary effluent storage lagoon was removed as part of the current wastewater treatment plant improvements. In 2020 construction was started on a new raw influent pumping station, a course bar screen, fine bar screens and a 7.5 mg equalization basin. The plant's pumping capacity will be increased to 45 mgd. Of this flow, 12.7 mgd will go through the treatment plant and the balance will be stored in the equalization basin. These improvements are complete. The project cost approximately $15 million.

Sixty-eight percent of Fostoria's sewer system was combined. New sewers are separate. There are 23 CSOs, three of which are discharged to the east branch of the Portage River, and 20 to Caples-Flack Ditch. In 2024, the city had 69 CSO events that discharged 80.32 mg into the East Branch Portage River; there was 46.23" of rainfall recorded that year.

Northwestern Water and Sewer District

The district owns and operates a sanitary sewer force main that serves Charter Steel four miles north of Fostoria on U.S. 23. Additionally, the District serves a subdivision known as "Flechtner Heights" just north of Fostoria's incorporated limits.

Other Outside City Service Areas

Besides the FPA contiguous to the city, Fostoria provides wastewater treatment services to two non-contiguous areas via force main. These areas include:

- South of the City in Loudon Township of Seneca County along U.S. 23
- The Village of New Riegel

Package plants located in the FPA are listed in Table 5-91.

Table 5 - 91: Package Plants in the Fostoria Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Hammer-Heinsman Subdivision[A]	SE-11	Public		2PG00011	30,000
Poplar Village MHP[A]	SE-10	Public		2PY00032	18,750

[A]Status is active

Note: Data are based on current available data as of April 2019

Issues

Combined Sewer Overflows

Fostoria's NPDES permit was renewed on September 1, 2022 with an expiration date of August 31, 2027. The permit was modified on July 1, 2025 to add 19 CSOs. The permit modification expires on August 31, 2027. In August 2006, the United States of America on behalf of the U.S. EPA and the Ohio EPA, filed a complaint against the City of Fostoria, Ohio seeking injunctive relief and civil penalties, and alleging that the City of Fostoria violated the Clean Water Act and certain terms and conditions of the NPDES permit.

The City of Fostoria is currently working on the items required by the Consent Decree. The city has completed updated modeling of its sewer system and has submitted it to Ohio EPA and USEPA. The approval of the model is nearly complete. Once the approval is complete the typical year model will be submitted and a new Long Term Control plan will be prepared and submitted to Ohio EPA and USEPA along with a modified schedule for completion of the improvements. This was initiated based on the modified performance of the system as a result of the recently completed improvements at WWTP.

Unsewered Areas

Several unsewered portions of the Fostoria FPA are likely to need sewers. These areas include:

- A subdivision in Loudon Township, Seneca County, southeast of the corporate limits. No stream sampling data is available, but septic systems in the area are believed to be failing and discharging into the Wolf Creek drainage basin.
- State Route 18, just west of existing sewers. It is recommended by the Hancock County Health Department as a Critical Sewage Area.
- The triangle between Washington Township Roads 218 and 261. It is recommended by the Hancock County Health Department as a Critical Sewage Area.

New Subdivisions

It is the policy of the Plan that all new residential subdivisions in Wood County that are required to be platted under subdivision regulations: for plated subdivisions of more than five (5) lots, septic tanks or individual household sewage treatment systems shall not be permitted within the FPA boundary. New plated subdivisions shall connect to public sewers and be served by the Fostoria wastewater treatment plant.

Future Needs

- The City of Fostoria is facing significant improvements to its sewer system and wastewater treatment plant.
- Fostoria will continue implementation of its CSO Abatement Plan and and revision of its Long-Term Control Plan.
- Install sanitary sewers in developed but unsewered areas that have documented sewage problems.
- Construct sewer extensions to eliminate remaining problem areas and provide service to new developments. New package plants and septic systems should not be permitted in areas that may be served by public sewers.

Future collection system and wastewater plant improvements to meet the Long-Term Control Plan requirements in the FPA are provided in Table 5-92. These will be modified once the revised Long Term Control Plan is completed.

Table 5 - 92: Fostoria FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2025	2026	2027	2028	2029	2030	Future
LTCP: CSO No. 2 & 3 Elimination	Fostoria	$9,510,000		$9,510,000					
LTCP: CSO #5 Elimination & Structure Modification	Fostoria	**TBD**				TBD			
LTCP: WWTP Upgrades Phase II (Completed)	Fostoria	**$15,000,000**							
		$25,165,215							

Grand Rapids Facility Planning Area

The Grand Rapid Facility Planning Area (FPA) is a designated region within Grand Rapid area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Grand Rapid (Figure 5-37). The Grand Rapid FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by several communities which are represented by Designated Management Agencies. The responsibilities of each of these agencies are outlined below:

Designated Management Agency Responsibilities:

- **Village of Grand Rapids**: Owns and operates wastewater treatment facilities, and the collection system within its corporate limits, and connecting the Marina in Henry County to the Village system.

- **Northwestern Water and Sewer District:** Owns and operates collection systems and is responsible for planning and construction of public sanitary sewage systems in unincorporated areas of Wood County. Henry County Regional Water and Sewer was merged with Northwestern Water and Sewer District in 2020

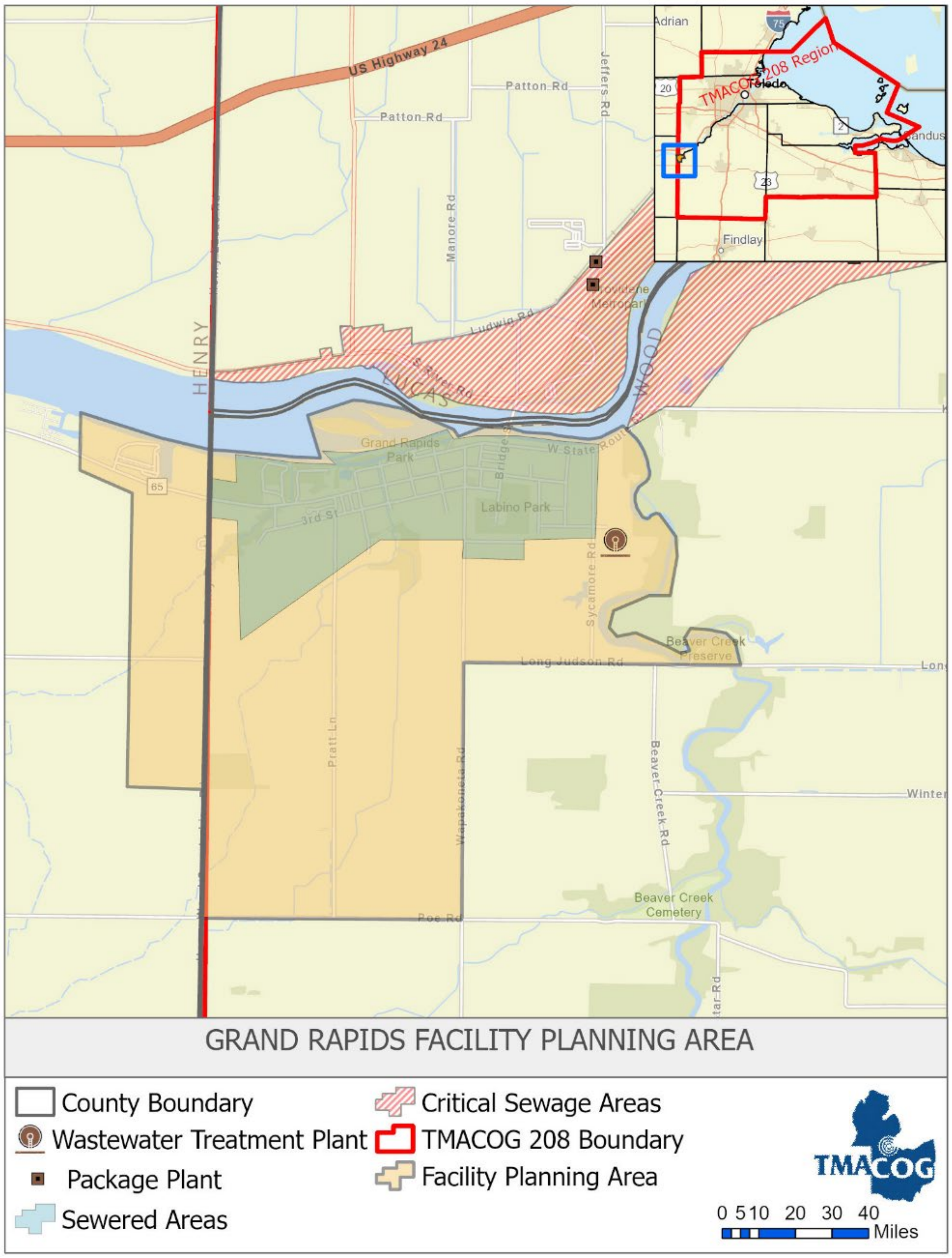


Figure 5 - 37: Grand Rapids Facility Planning Area

Table 5 - 93: Grand Rapids Area Population

Area	Total Population
Grand Rapids, entire jurisdiction	925
Grand Rapids Township, entire jurisdiction*	1,586
Washington Township, entire jurisdiction*	1,864
Damascus Township, entire jurisdiction*	1,783
Total	**6,158**

*only part of this jurisdiction is within the FPA boundary.

Source: The U.S. Census 2020 decennial census.

Present Facilities

The Grand Rapids WWTP was built in 1978; it is an oxidation ditch with an average capacity of 0.180 mgd and a hydraulic capacity of 0.6 mgd. Plant facilities include aerobic sludge digestion, and final chlorination. Sludge is transported to the Bowling Green WWTP for final treatment. Ohio EPA data shows an average flow of 0.063 mgd, and a peak flow of 0.434 mgd during the period of 2014-2018.

New Subdivisions

It is the policy of the Plan that all new residential subdivisions that are required to be platted under Wood County subdivision regulations, septic tanks or individual household sewage treatment systems for platted subdivisions of more than five (5) lots shall not be permitted within the FPA boundary. New platted subdivisions shall connect to public sewers and be served by the Grand Rapids wastewater treatment plant.

Future Needs

There is no future need during 2025 update of this plan.

Haskins Facility Planning Area

The Grand Rapid Facility Planning Area (FPA) is a designated region within Grand Rapid area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Grand Rapid (Figure 5-38). The Grand Rapid FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by several communities which are represented by Designated Management Agencies. The responsibilities of each of these agencies are outlined below:

Designated Management Agency Responsibilities:

- **Village of Haskins**: Owns and operates wastewater treatment facilities, and the collection system within the corporate limits.

- **Northwestern Water and Sewer District:** Will own and operate collection systems outside the corporate limits when built and will convey sewage to Haskins WWTP for treatment. In 2005, the District signed a 40-year agreement with Haskins for the Village to accept average daily flows of 50,000 gpd of sewage; additional flows may be negotiated.

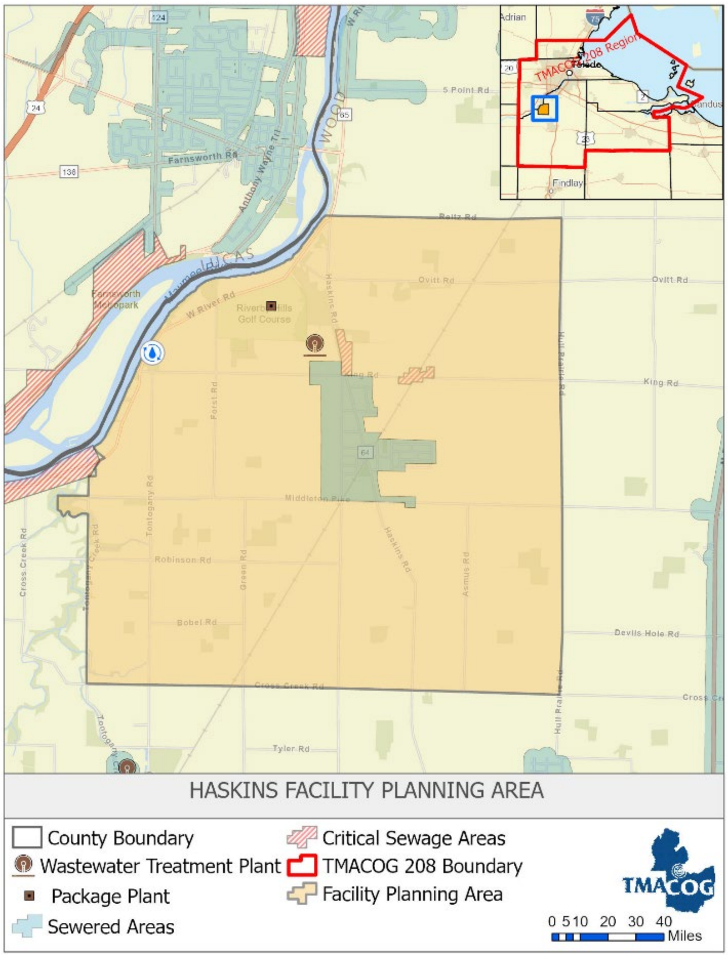


Figure 5 - 38: Haskins Facility Planning Area

Table 5 - 94: Haskins Area Population

Area	Total Population
Haskins, entire jurisdiction	1,245
Middleton Township, entire jurisdiction*	5,611
Washington Township, entire jurisdiction*	1,864
Total	**8,720**

*only part of this jurisdiction is within the FPA boundary.
Source: U.S. Census 2020 decennial census.

Present Facilities

The existing Haskins WWTP was built in 2006. The plant is a 300,000 gpd sequencing batch reactor facility, built at a total cost of $2.76 million. The WWTP site is 40 acres on the west side of SR 64, just on the north end of the Village. The receiving stream is a ditch along SR 64, flowing north into the Maumee

River. Ohio EPA data shows an average flow of 0.176 mgd, and a peak flow of 0.852 mgd during the period of 2014-2018. Liquid sludge is applied to agricultural land.

Package plants located in the FPA are listed in Table -95.

Table 5 - 95: Package Plants in the Haskins Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Riverby Hills Golf Club[A]	WO-46	Private*			4,000

[A]Status is active

*Facility type is assumed

Note: Data are based on current available data as of April 2019

Issues

Two groups of unsewered houses adjacent to the Village have been identified as Critical Sewage Areas, and need sewer service to eliminate problems from failed on-site systems.

- **State Route 64 north of King Road:** approximately 19 houses are in this area north of town. Bypassing sewage from failed septic systems is present in the roadside ditch. The septic systems for most of these houses are believed to have failed. Therefore, sanitary sewers should be extended to eliminate these septic systems. In 2000, the Wood County Health Department conducted a sanitary survey in this area.
- **King Road / RR:** an unincorporated area on the north side of King Road just east of the railroad tracks. There are 10 houses in this area; a sanitary survey of this area has not been conducted. Sanitary sewers may be needed here in the future.

New Subdivisions

It is platted policy of the Plan that all new residential subdivisions that are required to be platted under Wood County subdivision regulations, septic tanks or individual household sewage treatment systems for platted subdivisions of more than five (5) lots shall not be permitted within the FPA boundary. New plated subdivisions shall connect to public sewers and be served by the Haskins wastewater treatment plant.

Future Needs

Support planning and funding to provide sanitary sewer capabilities to eliminate individual and household septic systems in Critical Sewage Areas.

Hoytville Facility Planning Area

The Hoytville Facility Planning Area (FPA) is a designated region within village of Hoytville area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Hoytville (Figure 5-39). The Hoytville FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by Northwestern Water and Sewer District which is represented by Designated Management Agencies. The responsibilities of this agency are outlined below:

Designated Management Agency Responsibilities:

- **Northwestern Water and Sewer District:** Owns and operates wastewater treatment facilities and collection system.

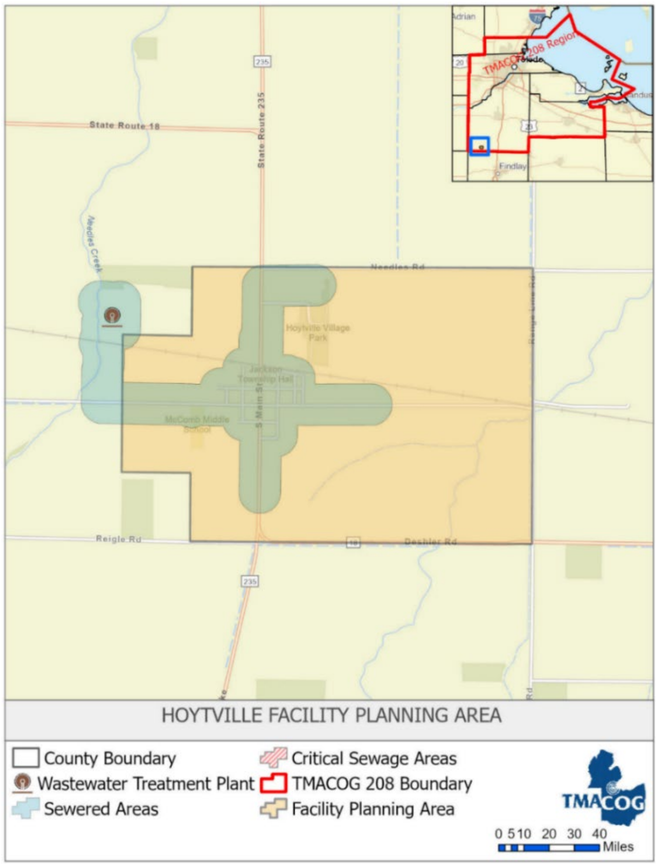


Figure 5 - 39: Hoytville Facility Planning Area

Table 5 - 96: Hoytville Area Population

Area	Population
Hoytville, entire jurisdiction	220
Jackson Township, entire jurisdiction*	702
Total	**922**

*only part of this jurisdiction is within the FPA boundary.
Source: U.S. Census 2020 decennial census.

Present Facilities

Hoytville WWTP was built in 1990 with an average daily design flow of 0.036 mgd. A peak outflow of 0.056 mgd was noted during the period of 2023-2024. The plant is a three-cell controlled discharge lagoon system that discharges to the Needles Creek only during high flow. The collection is via a Septic

Tank Effluent Gravity (STEG) system with small diameter gravity pipes and on-lot septic tanks to capture solids. The Northwestern Water and Sewer District (District) is responsible for pumping the septic tanks and septage handling.

In 2018, the District completed an upgrade to the controlled discharge lagoon system. The project included a new access road, addition of rip rap, replacement of valves and control structures, along with fence repair and replacement. The project was funded by the District with the assistance of a Ohio Water Pollution Control Loan Fund (WPCLF) in the amount of $380,000.

New Subdivisions
It is the policy of the Plan that all new residential subdivisions that are required to be platted under Wood County subdivision regulations, septic tanks or individual household sewage treatment systems for platted subdivisions of more than five (5) lots shall not be permitted within the FPA boundary. New platted subdivisions shall connect to public sewers and be served by the Hoytville wastewater treatment plant.

Issues
Ohio EPA found excess infiltration and inflow (I/I) is a problem for the collection system. The small-diameter gravity sewer system was not designed to carry storm flows or groundwater. The District evaluated I/I issues, completed the Sanitary Sewer Evaluation Survey (SSES), and has submitted the final report to Ohio EPA. The following details some of the results and actions:

- Some I/I was found in manholes; therefore, manhole lining was completed in early 2011.
- Installation of a flow meter at the main pump station into the lagoon demonstrated that even though I/I remains, its severity was not as great as previously thought.
- Several manholes were replaced in 2023.

Future Needs
The existing pump station will require replacement within the next five years.

Table 5 - 97: Hoytville FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2025	2026	2027	2028	2029	2030	Future
Septic tank repair/replacement	NWWSD	$200,000					$200,000		

Luckey Facility Planning Area

The Luckey Facility Planning Area (FPA) is a designated region within village of Luckey area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Luckey (Figure 5-40). The Luckey FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by communities which are represented by Designated Management Agencies. The responsibilities of this agency are outlined below:

Designated Management Agency Responsibilities:

- **Village of Luckey**: Owns wastewater treatment facilities and the collection system within its corporate limits; however, these systems are operated by the Northwestern Water and Sewer District.
- **Northwestern Water and Sewer District:** Owns and operates collection system in unincorporated areas. The District operates the Luckey WWTP under contract with the Village. In 2006, the District entered a 40-year agreement with the Village of Luckey to accept average daily flows of 4,000 gpd of sewage; additional flows may be negotiated.

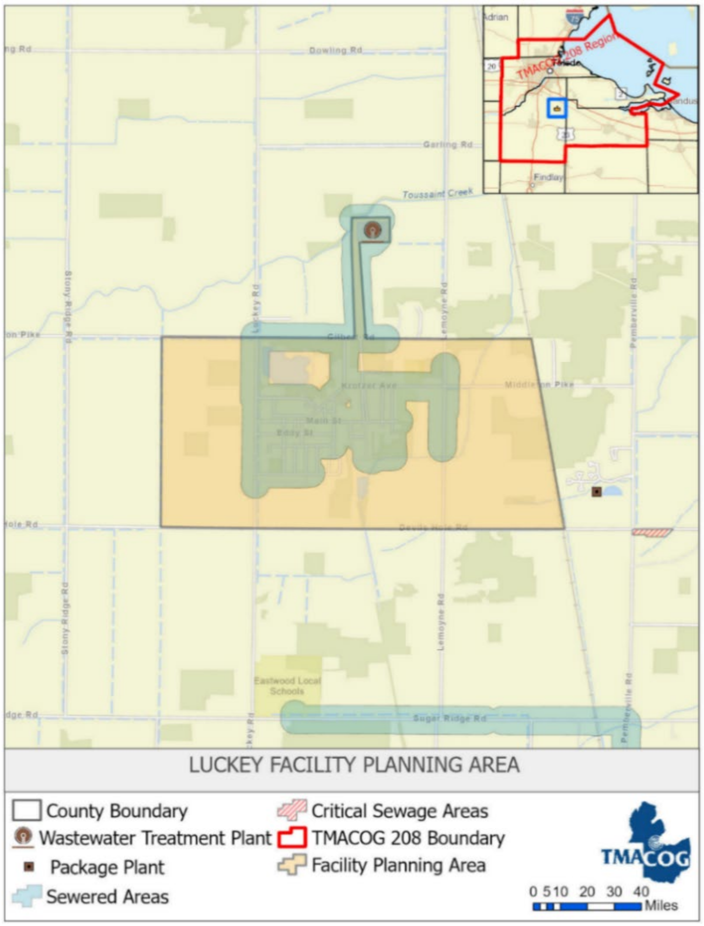


Figure 5 - 40: Luckey Facility Planning Area

Table 5 - 98: Luckey Area Population

Area	Total Population
Luckey, entire jurisdiction	1,009
Troy Township, entire jurisdiction*	4,097
Webster Township, entire jurisdiction*	1,230
Total	**6,336**

*only part of this jurisdiction is within the FPA boundary.

Source: U.S. Census 2020 decennial census.

Present Facilities

The Luckey WWTP was built in 1988 and is a 0.10 mgd controlled discharge lagoon facility. Hydraulic capacity of the system is 0.36 mgd. The peak discharge effluent flow in 2023-2024 was 0.070 mgd. Effluent is discharged to Toussaint Creek only during high flow.

Prior to construction of the WWTP, failed septic systems discharged to the Village storm sewer system. Pump stations were built to convey the septic tank effluent to the treatment plant. Existing septic tanks were originally left in place, with the Village responsible for pumping them out and disposing of the septage. In late 2007, sewer separation was completed, eliminating combined sewer overflows (CSOs) and septic tanks. The total project cost was $4.8 million, financed with $1.7 million in grants from U.S. EPA/STAG and USDA/Rural Development, and the balance in loans from USDA.

New Subdivisions

It is the policy of the Plan that all new residential subdivisions that are required to be platted under Wood County subdivision regulations, septic tanks or individual household sewage treatment systems for platted subdivisions of more than five (5) lots shall not be permitted within the FPA boundary. New platted subdivisions shall connect to public sewers and be served by the Luckey wastewater treatment plant.

Future Needs

There are no projects planned for the Luckey FPA at present.

North Baltimore Facility Planning Area

The North Baltimore Facility Planning Area (FPA) is a designated region within village of North Baltimore area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in North Baltimore (Figure 5-41). The North Baltimore FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by communities which are represented by Designated Management Agencies. The responsibilities of this agency are outlined below:

Designated Management Agency Responsibilities:

- **Village of North Baltimore**: Owns and operates the wastewater plant and sewers within its corporate limits.
- **Northwestern Water and Sewer District:** Owns and operates sewers in unincorporated areas of Wood County with treatment services provided by the North Baltimore WWTP.
- **Hancock County:** Owns and operates sewers in unincorporated areas of Hancock County with treatment services provided by the North Baltimore WWTP.

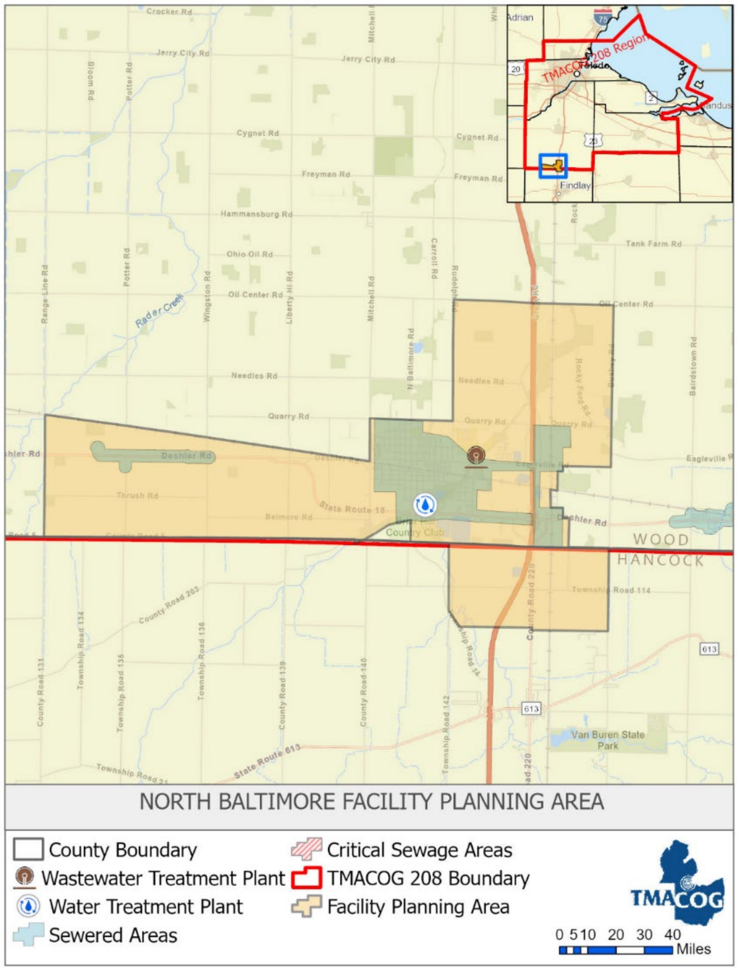


Figure 5 - 41: North Baltimore Facility Planning Area

Table 5 - 99: North Baltimore Area Population

Area	Population
Bloom Township, entire jurisdiction*	2,513
Henry Township, entire jurisdiction*	4,079
Jackson Township, entire jurisdiction*	702
Allen Township, entire jurisdiction*	2,754
Total	**10, 048**

*only part of this jurisdiction is within the FPA boundary.

Source: U.S. Census 2020 decennial census.

Present Facilities

The North Baltimore WWTP is a 0.8 mgd trickling filter plant. Ohio EPA data shows an average flow of 0.718 mgd, and a peak flow of 1.589 mgd during the period of 2015 - 2018. I/I was a serious problem contributing to combined sewer overflow (CSO) events. In 1997, in-house improvements to two overflow structures reduced CSO discharges by 60% during a rain event. In 2000, North Baltimore constructed a 200,000-gallon sludge holding tank to provide 180-day storage capacity at a cost of $300,000. The Village constructed new sludge dewatering facility in 2009 at a cost of $780,000.

The Notice to Proceed for the Phase I Sewer Separation Project was completed in May 2012. CSO #1 on Water Street was eliminated in April 2012. Funding for the project was provided by Ohio Water Development Authority (OWDA), U.S. EPA State and Tribal Assistance Grant (STAG), and Ohio Public Works Commission (OPWC) during construction and final long-term financing was provided by U.S. Department of Agriculture and Rural Development (USDA-RD). After completion of the Phase 1 sewer separation project, 32 septic tanks have been abandoned and the properties connected to the new sanitary sewer system.

The Village issued the Notice to Proceed to the contractor for the Phase II Sewer Separation Project in January 2013. The project was completed in 2014 at an estimated cost of $9,700,000. Completion of this project will satisfy the Ohio EPA's requirement for the Village to separate all sewers by 2017. Funds were provided by the Community Development Block Grant program (CDBG) in the amount of $600,000 and by OPWC in the amount of $449,999. The remaining funds are being provided by USDA-RD.

With completion of the sewer separation projects, the wastewater treatment plant is experiencing significant reductions to its flow. In 2016, improvements were completed for the wastewater treatment headworks. The equipment in the headworks (comminatory/screening and raw sewage pumping) area of the wastewater treatment plant were becoming problematic for the plant operators. The electrical gear that services the headworks was also becoming a maintenance/reliability issue. Problems have also been noted in matching the lower flows the plant has been seeing since the completion of the sewer separation projects. These improvements were completed in October 2016 at a total cost of $1.3 million with funding from the USDA-RD.

In 2018, the Village implemented improvements to the Quadland sanitary lift station that serves the commercial area on the east side of the Interstate 75/State Road 18 interchange.

In 2010, sewers in Henry and Jackson Townships were built to serve the CSX intermodal facility. Initially wastewater treatment was provided by a 5,000 gpd extended aeration package plant. It faced operational challenges of being too large for the actual flow. Another difficulty was finding an acceptable receiving stream for its treated effluent. The CSX plant was abandoned and removed in 2016, in favor of a connection to North Baltimore for treatment services. Future sewer extensions will be needed to accommodate economic development. The FPA boundary follows the service contract area agreed to between CSX and Northwestern Water and Sewer District (District).

Issues

Ohio EPA approved the renewal of North Baltimore's Long-Term Control Plan (LTCP) for combined sewer overflows in 2020. North Baltimore is required to report on the status of LTCP implementation annually. The Village's NPDES permit required total separation of the collection system in 2017. The permit also required post construction monitoring of the system to determine if the CSO goals have been met and submission of a written report in January 2019 on the results of the post construction monitoring. Per Ohio EPA, the Village needs to complete post construction compliance monitoring on the last CSO. There were four overflows reported between 4/1/15 and 7/1/17; no overflows have been reported since July

2017.

In 2020, the Village completed a "smoke test" of the complete sanitary sewer system as part of the CSO compliance requirements. Specific project improvement recommendations are being prepared in conjunction with assistance from the Great Lakes Community Action Partnership.

The NPDES permit indicates a written status report on the plant's compliance with their copper final effluent limits. If they are not able to meet the copper effluent limits the status report shall indicate how the Village intends to meet this limit and if additional construction will be required. The Village sent a status report prior to June 2015 stating that they would be able to meet the limits; their data shows no limit violations.

The NPDES permit also indicates the Village shall evaluate its ability to meet *Escherichia coli* limits with its existing facilities. The Village has evaluated its ability to meet the *E. coli* limits with the existing facilities, which they are still using for disinfection.

The wastewater treatment plant is reporting age/condition related issues at the wastewater treatment plant headworks. Improvements to the facility are planned to maintain the Village's ability to comply with permit conditions.

The FPA covers part of the corridor US 25 / I-75. The Wood County Comprehensive Plan identifies this area for employment opportunities and is therefore included in the FPA with a potential for requiring future service. The area is presently rural with no public sewerage facilities in this area, active package plants, or unsewered developed areas.

Northwestern Water and Sewer District

In 2018, the Northwestern Water and Sewer District (NWWSD) and the Village executed a contract for sewer service to the CSX facility and surrounding area. This area is located to the west of the Village on State Route 18 and Liberty Hi Roads. Significant development is expected in the area and a 12" sanitary sewer and pump station have been constructed for future extension as the area develops.

New Subdivisions

It is the policy of the Plan that all new residential subdivisions that are required to be platted under Wood County subdivision regulations, septic tanks or individual household sewage treatment systems for platted subdivisions of more than five (5) lots shall not be permitted within the FPA boundary. New platted subdivisions shall connect to public sewers and be served by the North Baltimore wastewater treatment plant.

Future Needs

The following improvements are planned:

- New screening and grinding system for the raw sewage pump station.
- New variable speed lift pumps for the raw sewage lift station.
- New electrical switchgear to replace the existing switchgear that serves the raw sewage pumps and screening area.
- New PLC control system to replace the failed annunciator panel and run the raw sewage pumps.

- New lab facility to house the lab that is currently located above the raw sewage pumping station.
- Sewer service area expansions in Henry and Jackson Townships are likely to be needed to facilitate economic development of the CSX intermodal facility and associated.

Based on current plant performance, no capital projects are anticipated to be required for copper or *E. coli* limit compliance. There are no other projects planned at present.

Otsego Facility Planning Area

The Otsego Facility Planning Area (FPA) is a designated region within village of Otsego area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in North Otsego (Figure 5-42). The Otsego FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by Northwestern Water and Sewer District which is represented by Designated Management Agencies. The responsibility of this agency is outlined below:

Designated Management Agency Responsibilities:

- **Northwestern Water and Sewer District:** Responsible for planning public sewerage system; the District owns and operates the collection system and wastewater treatment plant.

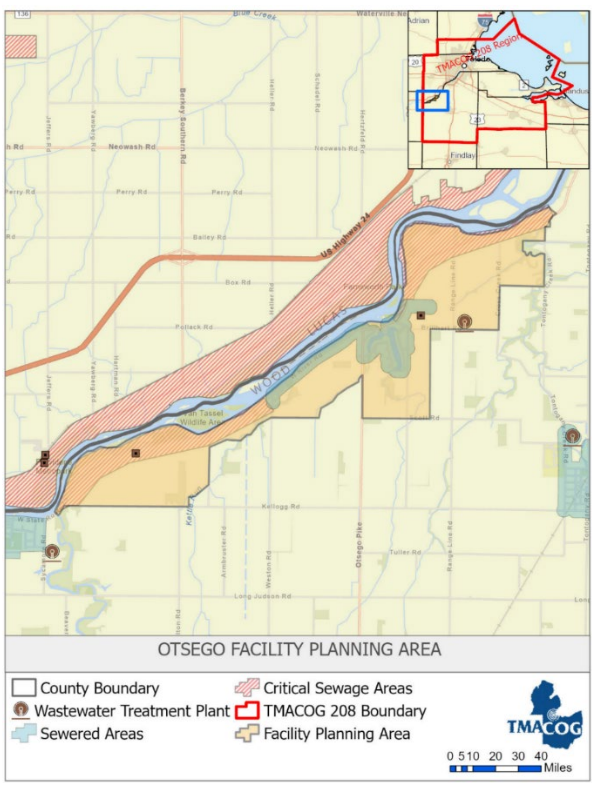


Figure 5 - 42: Otsego Facility Planning Area

Table 5 - 100: Otsego Area Population

Area	Total Population
Grand Rapids Township, entire jurisdiction*	1,586
Washington Township, entire jurisdiction*	1,864
Total	**3,450**

*only part of this jurisdiction is within the FPA boundary.
Source: U.S. Census 2020 decennial census.

Present Facilities

Most of the Otsego area is not served by a public sewage system. The one public facility is a package plant owned and operated by the Northwestern Water and Sewer District (the District) that serves the Williamsburg-on-the-River subdivision in Washington Township and West River Road, Otsego Road to Weston Road including Nazareth Hall. This WWTP was built in 2009 and is a 50,000 gpd extended aeration plant that can be expanded. Ohio EPA data shows an average flow of 0.026 mgd 2020-2021. The District took the original Williamsburg WWTP, built in 1972, out of service in 2009. The new treatment plant was designed to provide service to the entire Otsego FPA. The new WWTP, pump station, and force main from the old WWTP, outfall sewer to the Maumee River, and removal of the old WWTP cost $1,311,235. The project was funded with a $536,634 American Recovery and Reinvestment Act (ARRA) principle-forgiveness loan and the balance financed over a period of 40 years. The average monthly effluent flow in 2023-2024 was 0.25 mgd.

Some houses along SR 65, outside the Williamsburg subdivision, are being added to this WWTP's service area. Liquid sludge is transported to the City of Bowling Green WWTP for processing to Class A sludge. Package plants located in the FPA are listed in Table 5-101.

Table 5 - 101: Package Plants in the Otsego Facility Planning Area

Package Plant	Map ID	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Riverview Manor Trailer Park[A]	WO-11	Private		2PY00061	3,500
Williamsburg-on-the River WWTP[A]	WO-84	Public	2009	PG00097	50,000

[A]Status is active

Note: Data are based on current available data as of April 2019

Issues

Unsewered Areas

The entire riverfront between Grand Rapids and Haskins is a potential growth area. Public water is available and additional development is very likely to proceed. Many of the houses in this planning area are located between River Road (SR 65) and the Maumee River. The bank of the river is steep, the lots are small, and there is no room for an acceptable leaching field. On the other side of River Road, new housing will need to meet the present lot size requirements for sewage disposal.

Williamsburg-on-the-River WWTP

An aggressive I & I removal program, which included sanitary sewer grouting and lining was completed in 2018. Private I/I efforts are currently underway in the Williamsburg subdivision.

Future Needs

There was no future need during 2025 update.

Pemberville Facility Planning Area

The Pemberville Facility Planning Area (FPA) is a designated region within village of Pemberville area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Pemberville (Figure 5-43). The Pemberville FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by communities which are represented by Designated Management Agencies. The responsibilities of each of these agencies are outlined below:

Designated Management Agency Responsibilities:

- **Village of Pemberville**: Owns and operates wastewater treatment facilities, and collection system within its corporate limits.
- **Northwestern Water and Sewer District:** Owns capacity in the Pemberville WWTP and will own and operate collection system in unincorporated areas, if and when built, connecting to the Village for treatment services. The District entered into an agreement with Pemberville for the Village to accept average daily flows of 50,000 gpd of sewage; additional flows may be negotiated.

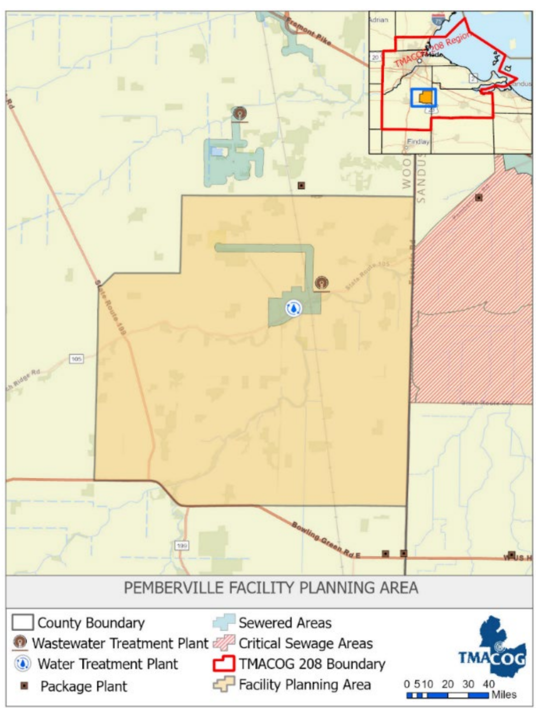


Figure 5 - 43: Pemberville Facility Planning Area

Table 5 - 102: Pemberville Area Population

Area	Total Population
Pemberville, entire jurisdiction	1,3626
Freedom Township, entire jurisdiction*	2,649
Troy Township, entire jurisdiction*	4,097
Webster Township, entire jurisdiction*	1,230
Total	**21,602**

*only part of this jurisdiction is within the FPA boundary.
Source: U.S. Census 2020 decennial census.

Present Facilities

The Pemberville WWTP is a sequencing batch reactor facility built in 2011. The plant was designed for 0.4 mgd average daily flow, 1.0 mgd peak dry weather flow, and 1.3 mgd peak wet weather flow. Ohio EPA data shows an average flow of 0.242 mgd and a peak flow of 0.746 mgd during the period of 2014-2018. The plant was designed to treat greater wet weather flows, and provide service to portions of Freedom and Troy Townships surrounding the Village. The plant cost $2.5 million to build, and replaced the previous plant, which included an oxidation ditch, a polishing pond, and aerated sludge digesters. The plant is equipped with ultraviolet effluent disinfection. Liquid sludge is applied to agricultural land.

1. The sewers were originally combined, with four overflow points. Pemberville completed its Combined Sewer Overflow (CSO) Abatement Plan by separating the entire system. The Plan, prepared in 1994, called for five phases. It was completed in 1999 at a cost of $2,037,618, financed through Ohio EPA over a 20-year period. Pemberville spent $546,730 on additional sewer system improvements to exclude I/I between 2001 and 2009.

There are no package plants located in the FPA. The Eastwood High School package plant has been eliminated as part of an Eastwood school consolidation project. The School District requested Northwestern Water and Sewer District to construct a pump station and force the main to send the sanitary sewer flows to the Pemberville WWTP.

New Subdivisions

It is the policy of this Plan that all new residential subdivisions that are required to be platted under Wood County subdivision regulations, septic tanks or individual household sewage treatment systems for platted subdivisions of more than five (5) lots shall not be permitted within the FPA boundary. New platted subdivisions shall connect to public sewers and be served by the Pemberville wastewater treatment plant.

Future Needs

The NPDES permit issued in 2019 indicates that the Village shall evaluate the ability of its existing treatment facilities to meet the final effluent limit (1.0 mg/L) for phosphorus.

Perrysburg Facility Planning Area

The Perrysburg Facility Planning Area (FPA) is a designated region within village of Perrysburg area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Perrysburg (Figure 5-44). The Perrysburg FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by communities which are represented by Designated Management Agencies. The responsibility of each of these agencies are outlined below:

Designated Management Agency Responsibilities:

- **City of Perrysburg**: Owns and operates wastewater treatment facilities and portions of the collection system.
- **Northwestern Water and Sewer District:** Owns and operates portions of the collection system, connecting to Perrysburg system for treatment services.
- **City of Rossford:** Northwestern Water and Sewer District own and operates the collection system within Rossford, connecting a small portion of the collection system to Perrysburg system for treatment services.

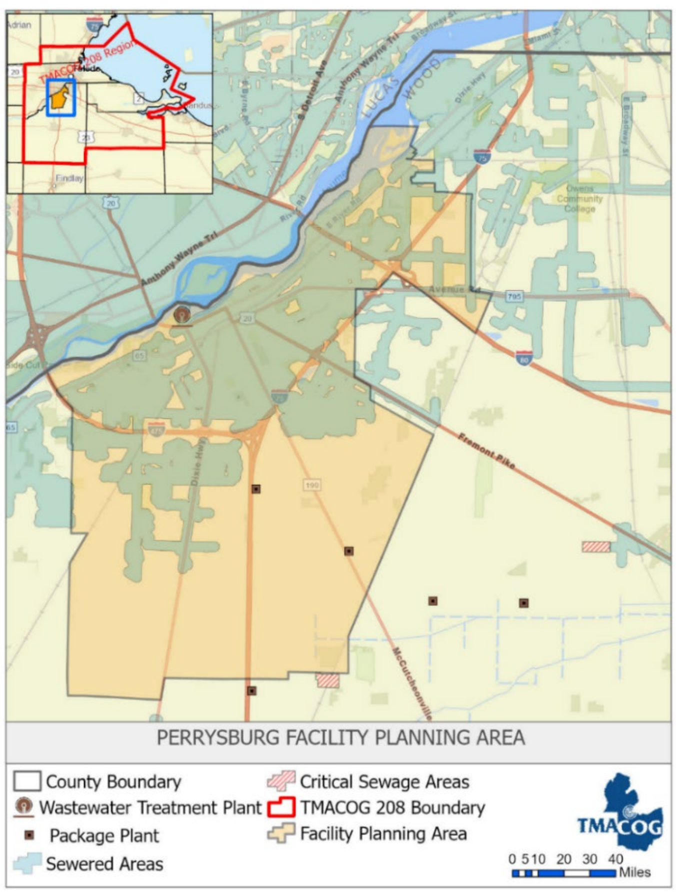


Figure 5 - 44: Perrysburg Facility Planning Area

Table 5 - 103: Perrysburg Area Population

Area	Population
Perrysburg, entire jurisdiction*	25,041
Rossford, entire jurisdiction*	6,299
Middleton Township, entire jurisdiction*	5,611
Perrysburg Township, entire jurisdiction*	13,571
Total	**50,522**

*only part of this jurisdiction is within the FPA boundary.
Source: U.S. Census 2020 decennial census.

Present Facilities

The City of Perrysburg WWTP has an average design capacity of 8.0 mgd, with a peak capacity of 24.0 mgd. Data from 2025 showed an average flow of 5.45 mgd. The plant was originally built in 1958 with expansions in 1972, 1986, and 1991 with recent upgrades in 2008, 2009, 2011, 2014, 2015, and 2021. . Capacity upgrades were needed because of growth in the service area, new stricter discharge limitations, and treatment of wet weather flows. The Perrysburg WWTP is an activated sludge facility with ultraviolet final effluent disinfection, post aeration, anaerobic sludge digestion, and one biosolids belt filter press and one volute dewatering press. Currently all biosolids are trucked to local landfills.

Issues

Sanitary Sewer Overflow (SSO) Elimination

About 600 acres of the older part of Perrysburg had a combined sewer system, with four wet-weather overflows. Perrysburg submitted a combined sewer overflow (CSO) Long Term Control Plan (LTCP) in 1996. This plan called for annual sewer separation projects over a 20-year period. The separation of sewers in this area was completed in 2017 at a final cost of over $29 million.

The CSO area was split into assessment districts for the Cherry and Elm Street regulator areas. The Elm Street CSO district covered one-half block west of Louisiana Avenue to East Boundary Avenue from the Maumee River to Grassy Creek. Separation of sewers in this area was divided into 13 districts. The Cherry Street CSO district covered west of Louisiana Avenue to West Boundary Street.

New storm sewers were installed in both Cherry and Elm Street CSO districts. New and existing catch basins were connected to the new storm sewers. Separation of the Elm Street CSO district was completed in 2001 at a cost of approximately $9.3 million. Separation of the Cherry Street CSO district was completed in November 2017 at a cost of approximately $20.1 million.

In December of 2023, the Ohio Environmental Protection Agency issued Director's Final Findings and Orders (DFFO). In these orders, the four CSOs were reclassified as Sanitary Sewer Overflows (SSOs) and therefore must be eliminated. The DFFO also required the elimination of an Emergency Response Sanitary Sewer Overflow (ER_SSO) located near the crossing of Maple Street over Grassy Creek. This was accomplished by lining the Grassy Creek Interceptor Sewer in 2024 at a cost of approximately $1.5 million.

Sewer separation projects since 1991 focused on removing stormwater collected from the right-of-way (i.e., streets). Some property owners have separated their private stormwater discharge from the sanitary sewer to the new sewers with financial assistance from City grants. The City increased available funding for private property separation grants in 2022 to encourage participation.

Unsewered Areas

There are two package plants located in this FPA, shown in Table 5-104. When public sewers become available, these plants will be abandoned and replaced by a tap to the public sewer.

Table 5 - 104: Package Plants in the Perrysburg Facility Planning Area

Package Plant	Map ID	Status	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Islamic Center of Greater Toledo	WO-102	Active	1991		8,300
Five Point MHP	WO-120	Active		2PY00073	6,600

Note: Data are based on current available data as of April 2019

Dowling: An unincorporated community, located at Dowling Road and Conrail tracks between Dunbridge and Carter Roads. Residences are served by septic systems. Dowling is not under orders to construct sewers. The community is split between the Bowling Green and Perrysburg FPAs. Dowling is identified as a Critical Sewage Area, which is under the jurisdiction of the Northwestern Water and Sewer District (District).

Shelton Gardens: A portion of Middleton Township in Wood County along Five Point Road from the CSX railroad tracks west to the Maumee River is also known as Shelton Gardens. In 2007, Ohio EPA ordered sanitary sewers for this area. Most of the area was in the Lucas County FPA, but the portion between Hull Prairie Road and the railroad tracks was in the Perrysburg FPA. Sanitary sewers were constructed on Five Point and River Roads in 2014 to partially address the unsanitary conditions due to failing septic systems. Orders are still in place for additional Five Points Road frontage to the rail east of Hull Prairie Road.

The portion of Shelton Gardens then in the Perrysburg FPA was moved to the Lucas County FPA subject to the following provisos of TMACOG Resolution 2007-26:

THAT the area along Five Point Road between Hull Prairie and the CSX tracks shall remain in the Lucas County FPA until a sewer connected to the Perrysburg system becomes available; and

THAT when a Perrysburg sewer becomes available, the area may revert back to the Perrysburg FPA; sanitary sewer services may be disconnected from the Lucas County system and connected to the Perrysburg system at the City of Perrysburg's discretion; and

THAT the City of Perrysburg and Northwestern Water and Sewer District agree that notwithstanding availability of a Perrysburg sewer, the Hull Prairie-CSX triangle shall remain in the Lucas County FPA and not be moved back to the Perrysburg FPA before January 1, 2028.

New Subdivisions

It is the policy of the Plan that for all new residential subdivisions that are required to be platted under Wood County subdivision regulations, septic tanks or individual household sewage treatment systems for platted subdivisions of more than five (5) lots shall not be permitted within the FPA boundary. New platted subdivisions shall connect to public sewers and be served by the Perrysburg wastewater treatment plant.

Recent Projects

- WWTP upgrades completed from 2005 to 2021 included the following: headworks improvements, new primary clarifier, primary thickener, biosolids storage area, new grit removal equipment, screening equipment, biosolids handling equipment, phosphorous removal improvements, office and staff facilities improvements, ultraviolet disinfection and plant SCADA system improvements.
- A digestor improvement project is currently under construction and estimated to be completed in 2026. This project includes a new methane flare, new boilers, new heat exchangers, new piping processes, and replacement of roof systems of all four digestors. One of these roofs will be a dual membrane system that will allow for the capture of approximately 77,000 cubic feet of biogas that will be used to heat the new boilers.
- Perrysburg is working with the Wood County Health District to identify and classify residential properties inside City limits which have no record of sanitary sewer connection. If a sanitary sewer is deemed available, connection will be enforced, and where any discharging Household Sewage Treatment System (HSTS) remains, the properties will be notified to seek individual National Pollutant Discharge Elimination System (NPDES) permit coverage.
- The City currently has a Primary Settling Tank Improvement project in the preliminary design stage. This project will evaluate the cost of adding an additional 66-foot diameter primary settling tank along with modeling treatment processes and influent flow modifications.
    - In 2022, the NWWSD completed a lining and rehabilitation project of sanitary sewers located on West Boundary. This sanitary sewer receives flows from the Ford Road Pumping Station.IN 2023, the NWWSD completed rehabilitation and expansion of the Ford Road Pumping Station. Capital Project investment $7.5 million.

Future Needs

- In June 2026, the City will submit an SSO Elimination Plan to OEPA. This plan will establish improvements in the City’s sanitary sewer collection system and WWTP for an as yet to be determined period. It is anticipated that projects will include sanitary sewer main and lateral lining and manhole rehabilitation to reduce I/I.
- Build sewer extensions to eliminate package plants and to provide service to new development. New package plants and septic systems are not to be permitted in areas where public sewers are available.
- The SR 25 Trunk Sewer, from Five Point Road to King Road has been designed. Construction will occur as necessitated by future development needs.
- The District anticipates performing extensive I&I reduction projects through main line lining, grouting, manhole rehabilitation and private lateral replacement within the Perrysburg FPA.

The capital improvement plan for the Perrysburg FPA is shown in Table 4-105.

Table 5 - 105: Perrysburg FPA Capital Improvement Schedule

Project	DMA	Total Cost						
			2024	2025	2026	2027	2028	Future
Rt 25 Sewer: King to Five Point	Perrysburg	**$4,300,000**						4,300,000
Sewer Rehabilitation	Perrysburg	**$8,000,000**			1,000,000	1,000,000	1,000,000	5,000,000
ER-SSO Elimination	Perrysburg	**$1,500,000**	1,500,000					
WWTP Upgrades	Perrysburg	**$21,000,000**			8,0000,000		15,000,000	
SS300 Area Sewer Replacement and Rehabilitation	Northwestern Water and Sewer District	**$5,000,000**						$5,000,000
		$39,80,000						

Risingsun Facility Planning Area

The Risingsun Facility Planning Area (FPA) is a designated region within village of Risingsun area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Risingsun (Figure 5-45). The Risingsun FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by Northwestern Water and Sewer District which is represented by Designated Management Agencies. The responsibility of this agency is outlined below:

Designated Management Agency Responsibilities:

- **Northwestern Water and Sewer District:** The Village of Risingsun, the Village of West Millgrove, Montgomery Township, and Scott Township are members of Northwestern Water and Sewer District (District). The District is responsible for public sewerage systems in both incorporated and unincorporated areas.

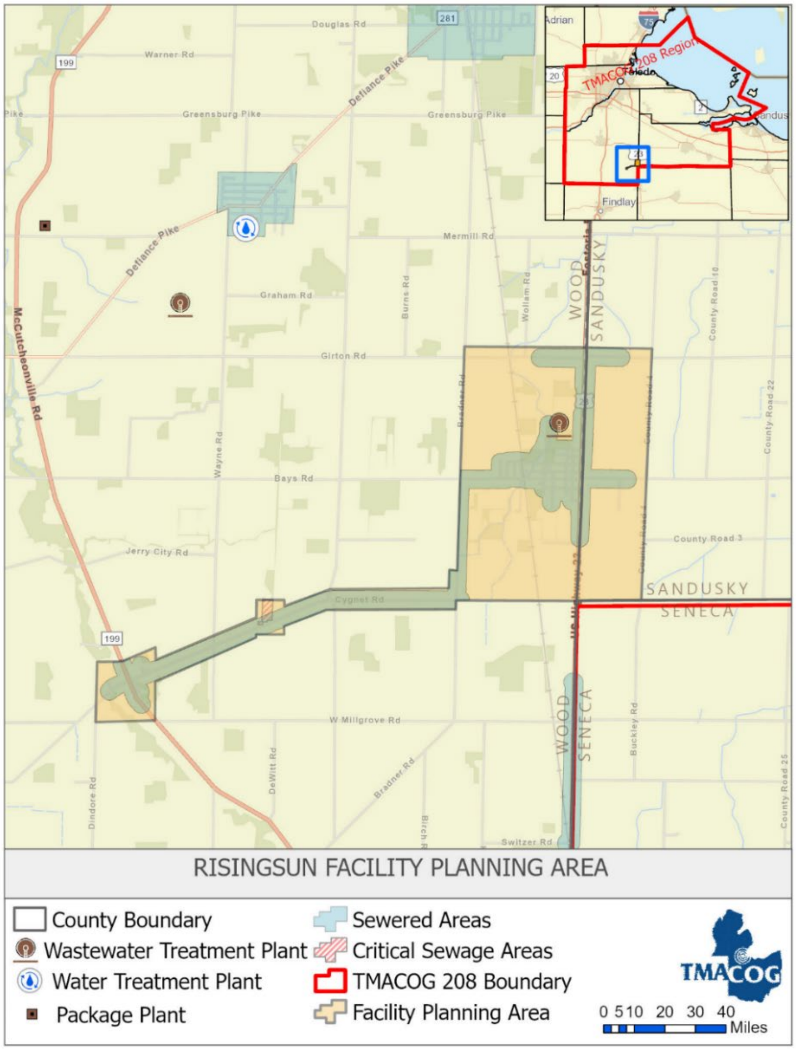


Figure 5 - 45: Risingsun Facility Planning Area

Table 5 - 106: Risingsun Area Population

Area	Population
Risingsun, entire jurisdiction (Wood County)	541
West Millgrove, entire jurisdiction	131
Montgomery Township, entire jurisdiction (Wood County)*	4,157
Scott Township, entire jurisdiction (Sandusky County)*	1,333
Perry Township, entire jurisdiction (Wood County*	15,668
Total	**21,830**

*only part of this jurisdiction is within the FPA boundary.

Source: U.S. Census 2020 decennial census.

Present Facilities

The Northwestern Water and Sewer District (the District) completed a conventional gravity/force main sewer system and WWTP in 2008 at a total cost was $4,799,434. Of that cost, $2,468,300 came from grants and local funds. The treatment plant is an extended aeration plant with an average daily design flow of 95,000 gpd; peak hydraulic capacity is 475,200 gpd (330 gpm). Its Class B sludge is disposed of by discharge to a larger POTW with sludge handling facilities. Ohio EPA data showed an average monthly flow of 0.033 mgd during 2023-2024.

- In 2012, sewers were installed to serve to Village of West Millgrove, and the critical sewage area at Bays and Bradner Roads. West Millgrove was connected to the Risingsun system via force main; the force main is available for service, and properties to which it is accessible were ordered to tap. These included buildings in the critical sewage area of Hatton that abut Cygnet Road, but most of the unincorporated town, about 17 residents, have no public sewerage system. Sewage treatment is handled by individual septic systems.
- A new headworks project was being completed by the District at the WWTP. The project included replacing the existing trash trap with a new precast dual channel vault to house a new augur monster and grinder, a bypass channel with a standard bar screen, and all necessary electrical, mechanical, and structural work.

Issues

Hatton is identified as a Critical Sewage Area (see **Chapter 6**) due to failing septic systems identified through sanitary surveys and inspections. New or replacement on-site sewage treatment systems and replacements are not practical or possible in many cases. Many of the suspected or failing systems are on small lots that do not have room for replacement leaching fields or soil conditions are poor due to shallow bedrock, tight silt/clay soils, and/or seasonally high ground water.

New Subdivisions

It is the policy of the Plan that all new residential subdivisions that are required to be platted under Wood County subdivision regulations, septic tanks or individual household sewage treatment systems for platted subdivisions of more than five (5) lots shall not be permitted within the FPA boundary. New platted subdivisions shall connect to public sewers and be served by the Risingsun wastewater treatment plant.

Future Needs

- The town of Hatton remains as a Critical Sewage Area. The town's approximately 17 residences are close but not accessible to the District's sanitary sewer. Existing septic systems are believed to be inadequate; a sanitary survey is needed to determine and document their status. It is likely that sanitary sewers will be needed, and financial assistance to make the project feasible.

This Plan supports financial assistance to install sewers and provide treatment for unsewered areas.

Tontogany Facility Planning Area

The Tontogany Facility Planning Area (FPA) is a designated region within village of village of Tontogany area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Tontogany (Figure 5-46). The Tontogany FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by Northwestern Water and Sewer District which is represented by Designated Management Agencies. The responsibility of this agency is outlined below:

Designated Management Agency Responsibilities:

- **Northwestern Water and Sewer District:** Owns and operates wastewater treatment facilities and the collection system.

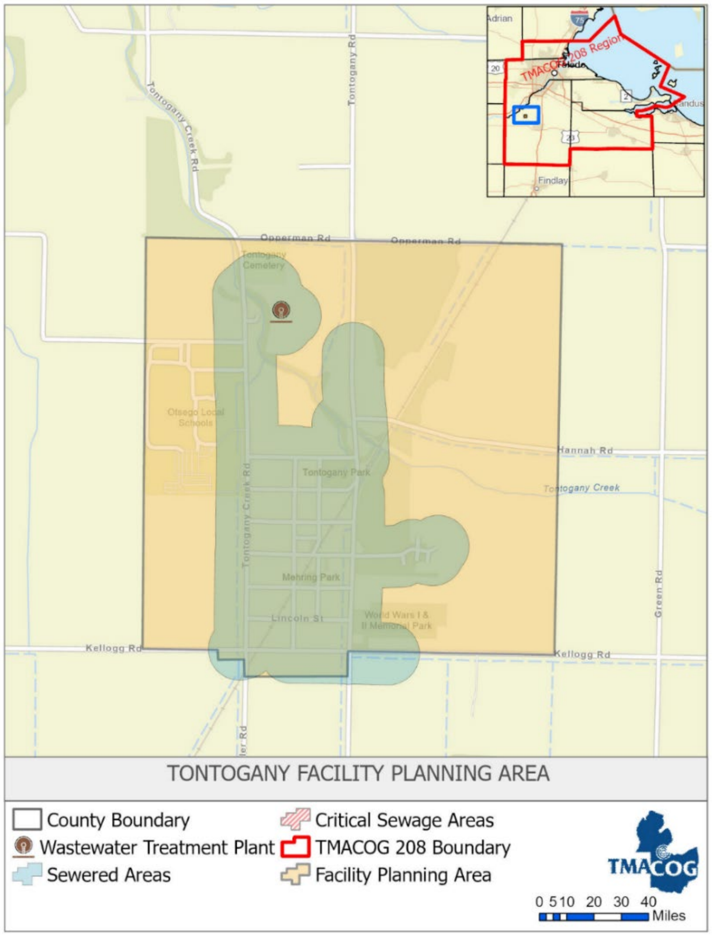


Figure 5 - 46: Tontogany Facility Planning Area

Table 5 - 107: Tontogany Area Population

Area	Total Population
Tontogany, entire jurisdiction	387
Washington Township, entire jurisdiction*	1,864
Total	**2,251**

*only part of this jurisdiction is within the FPA boundary.

Source: U.S. Census 2020 decennial census.

Present Facilities

The Tontogany WWTP is a four-cell aerated lagoon facility with ultraviolet disinfection. The facility was built in 1985 and has an average design capacity of 0.10 mgd and a hydraulic capacity of 0.33 mgd. Ohio EPA data showed an average monthly flow of 0.054 mgd during the period of 2023-2024. The conventional gravity sewer system was also built in 1985.

In 2006, Northwestern Water and Sewer District (District) bought approximately 14 acres for potential future expansion of WWTP. In 2016, rehabilitation work was completed for the existing wastewater pumping station located at North Street.

There are no package sewage treatment plants located in the FPA.

Issues
The Tontogany WWTP has had some recent difficulty in maintaining the ammonia limits listed in the current NPDES permit. The District performed a study to determine possible alternatives to improve the ammonia removal process and is reviewing the results. Additionally, during the study process it was determined that the WWTP requires the lagoons to be drained and the sludge removed. In 2020, the sludge was removed and with upgraded aeration equipment, it is anticipated that the lagoons will meet the permit limits.
The Ohio EPA, upon review of the existing permit, determined that the winter ammonia limits could be removed and that the summer ammonia limit could be raised. This has allowed the plant effluent to comply, excepting during brief periods in late winter. The District is planning to install floating hexagonal covers in 2025 in the cells to resolve these issues.

Future Needs
The District plans to continue its evaluation of the plant to determine the best. The capital improvement plan for the Tontogany FPA is shown in Table 5-108.

Table 5 - 108: Tontogany FPA Capital Improvement Schedule

Project	DMA	Total Cost							
			2025	2026	2027	2028	2029	2030	Future
Tontogany WWTP Improvements	Northwestern Water and Sewer District	**$600,000**	$100,000						$500,000

Wayne Facility Planning Area

The Wayne Facility Planning Area (FPA) is a designated region within the village of Wayne area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Wayne (Figure 5-79). Wayne FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by Village of Wayne Northwestern Water and Sewer District which is represented by Designated Management Agencies. The responsibility of these agencies are outlined below:

Designated Management Agency Responsibilities:

- **Village of Wayne**: Owns and operates wastewater treatment facilities, and the collection system within the corporate limits.

- **Northwestern Water and Sewer District:** Plans, and will own and operate collection system in unincorporated areas, if and when built, connecting to the Village for treatment services.

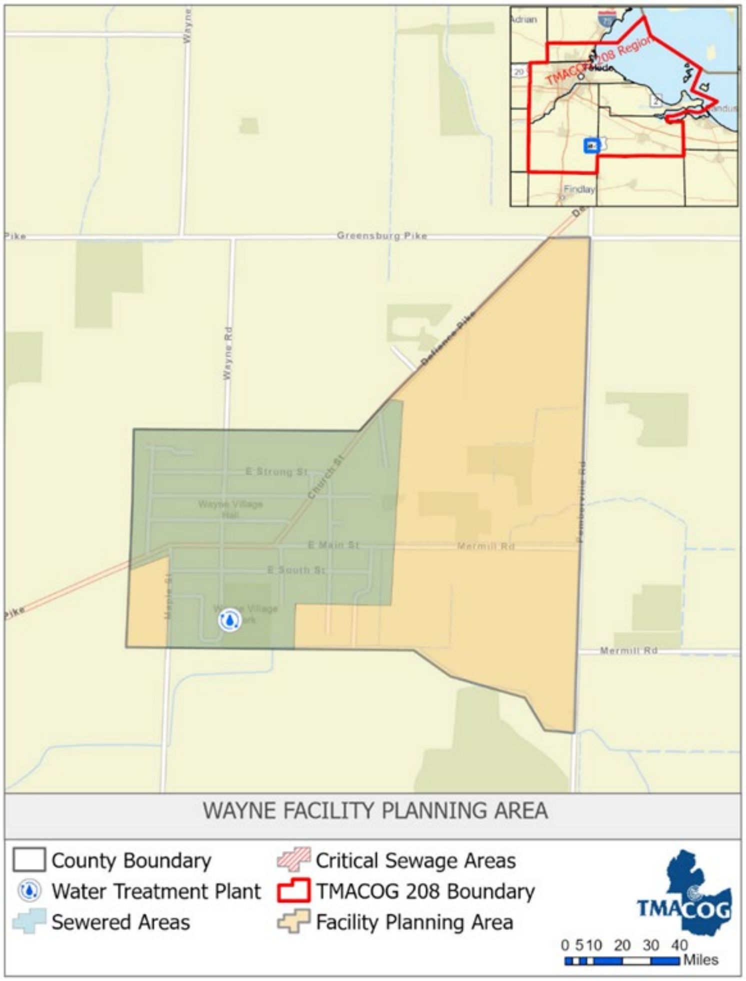


Figure 5 - 47: Wayne Facility Planning Area

Table 5 - 109: Wayne Area Population

Area	Total Population
Wayne, entire jurisdiction	841
Montgomery Township, entire jurisdiction*	4,157
Total	**4, 998**

*only part of this jurisdiction is within the FPA boundary.
Source: U.S. Census 2020 decennial census.

Present Facilities

The Wayne WWTP is a controlled discharge lagoon facility, built in 1997. The system uses conventional gravity sewers. The design capacity is 0.092 mgd. Ohio EPA data showed an average flow of 0.562 mgd when discharging, average flow of 0.020 mgd daily, and a peak flow of 1.361 mgd during the period of 2014-2018. Total discharge over the five-year period was 37.082 mg, with 66 discharge days.

New Subdivisions
It is the policy of the Plan that all new residential subdivisions that are required to be platted under Wood County subdivision regulations, septic tanks or individual household sewage treatment systems for platted subdivisions of more than five (5) lots shall not be permitted within the FPA boundary. New platted subdivisions shall connect to public sewers and be served by the Wayne wastewater treatment plant.

Future Needs
There are no projects planned for the Wayne FPA at the present.

Weston Facility Planning Area

The Weston Facility Planning Area (FPA) is a designated region within the village of Weston area where wastewater management, including sewage treatment and disposal, is planned and coordinated. The FPA boundaries define the areas that are expected to be serviced by the wastewater treatment facilities in Weston (Figure 5-48). Weston FPA ensures that wastewater infrastructure is adequately planned to meet the needs of the population within these boundaries, considering factors like population growth, environmental impacts, and regulatory requirements. This FPA is managed by Northwestern Water and Sewer District which is represented by Designated Management Agencies. The responsibility of this agency is outlined below:

Designated Management Agency Responsibilities:
- **Northwestern Water and Sewer District:** Owns and operates wastewater treatment facilities, and collection system.

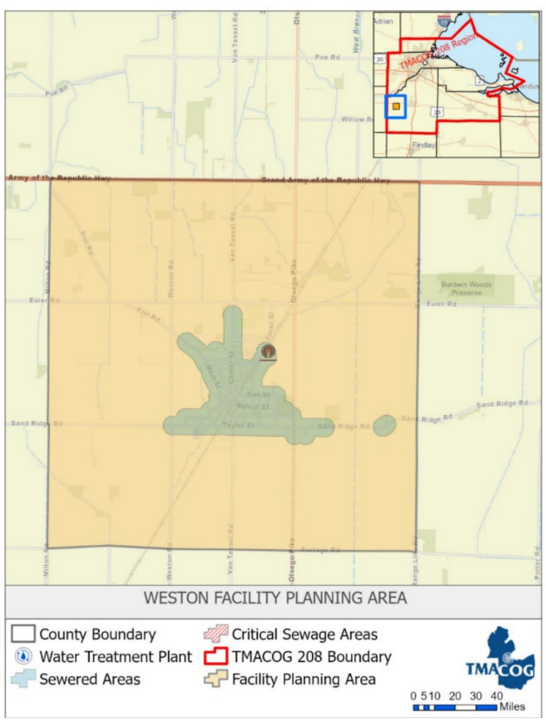


Figure 5 - 48: Weston Facility Planning Area

Table 5 - 110: Weston Area Population

Area	Total Population
Weston, entire jurisdiction	1,455
Weston Township, entire jurisdiction*	2,124
Estimates within the FPA boundary	**3,579**

*only part of this jurisdiction is within the FPA boundary.
Source: U.S. Census 2020 decennial census.

Present Facilities

Weston WWTP is an extended aeration facility with aerobic sludge digestion, effluent chlorination/dechlorination which was converted to ultraviolet in 2006, and aerated flow equalization ponds. The plant has sludge drying beds, but current practice is not to use them, and liquid sludge is transported to the City of Bowling Green WWTP for processing to Class A sludge. The plant was built in 1967, with expansion in 1983. The 1983 improvements included separating the sewer system. Average design capacity was 0.21 mgd and hydraulic capacity was 0.70 mgd. in 2004-2005, the average design flow was increased to 0.28 mgd and peak flow to 0.85 mgd. Implementation of a General Plan led to further improvements for the plant to operate effectively and meet permit requirements. The improvements, completed in 2011 at a cost of $1.3 million, included headworks design, optimized raw wastewater flow to secondary treatment, fine-bubble diffusers, and other secondary process improvements.

Ohio EPA data shows an average flow of 0.24 mgd during the period of 2023-2024. The Northwestern Water & Sewer District (District) is in the process of removing I & I by enforcing I & I elimination based on the previous studies and televising the sewers during heavy rains. In 2018, the District completed a rehabilitation project on two pump stations

Issues

Inflow and infiltration continue to be an issue and the District has to rehabilitate a significant portion of the sewer collection system. In 2021, The District completed a $1.3 million sanitary sewer rehab project. The majority of this project is trenchless, targeting I/I issues, with a small portion of open cut on Ohio Street. Private inflow and infiltration issues will be addressed over the next several years through the private grant program for stormwater removal. The WWTP currently has a peak capacity of 500,000 gpd, however in wet weather the plant experiences flow rates greater than the capacity of the plant. Currently the plant has flow equalization basin capacity of between 1.1 MG and 1.6 MG depending upon the amount of freeboard used within the two existing ponds. The District has recently completed a project aimed at reducing inflow and infiltration within the sanitary sewers in the Weston WWTP collection system. This project was completed in April 2022.

NPDES Permit issued on July 1, 2024 Compliance Schedule

PART I, C. - SCHEDULE OF COMPLIANCE

Milestone Summary Report

- Discharge Prevention Plan 15099 12 months after the permit effective date
- No Feasible Alternative Analysis Status Report 95999 24 months after the permit effective date
- No Feasible Alternative Analysis Status Report 95999 36 months after the permit effective date

1. Bypassing: No Feasible Alternatives Analysis and Schedule

The Weston WWTP includes a bypass which re-routes a portion of wastewater flow to two-551,000-gallon lagoons during storm events. When the capacity of the lagoons is exceeded, the lagoons will discharge through outfall 002. Bypassed flow does not receive the following treatment: activated sludge aeration, secondary clarification and disinfection. Excessive influent flow rates are caused by inflow, and infiltration which results in plant bypasses. These treatment plant bypasses are not authorized by this permit, including Part I.C., Schedule of Compliance. The permittee shall undertake the following actions:

a. The permittee shall conduct a comprehensive analysis of all feasible alternatives necessary to eliminate the bypass at the treatment plant and any overflows in the collection system. This analysis shall address and evaluate the following:

i. Inflow/infiltration reduction within the collection system.

ii. Additional wastewater storage and flow equalization.

iii. Providing additional secondary treatment capacity which includes an analysis of constructing additional secondary capacity as well as an analysis of process changes to enhance secondary treatment capacity.

iv. The analysis shall also evaluate methods that will enhance the treatment of any bypassed flow.

v. Costs associated with the respective alternatives.

vi. A proposed schedule for implementation of recommended improvements (if required) in the collection system and/or the treatment plant.

b. The permittee shall submit a report containing the comprehensive analysis required in Item 1.a as soon as possible, but no later than 12 months from the effective date of this NPDES permit. 12 months after the permit effective date

c. Ohio EPA will review the report submitted under Item 1.b above and provide any necessary comments

to the permittee. The permittee shall respond to any deficiencies in the analysis as noted by Ohio EPA within 30 days of receiving Ohio EPA comments.

d. Within 30 days of notification of review and acceptance by Ohio EPA, the permittee shall initiate

implementation of the recommendations of the report, including any revisions necessary to address Ohio EPA comments.

e. The permittee shall submit annual status reports towards implementation of the evaluation required

under Schedule of Compliance Item 1.d. in accordance with the following schedule:

i. No later than 24 months after the effective date of the permit; and 24 months after the permit effective date

ii. No later than 36 months after the effective date of the permit. 36 months after the permit effective date

iii. All work necessary to comply with the implementation schedule of the selected alternative under this Schedule of Compliance Item 1. shall be fully completed by the expiration date of this permit.

New Subdivisions

It is the policy of the Plan that all new residential subdivisions that are required to be platted under Wood County subdivision regulations, septic tanks or individual household sewage treatment systems for platted subdivisions of more than five (5) lots shall not be permitted within the FPA boundary. New platted subdivisions shall connect to public sewers and be served by the Weston wastewater treatment plant.

Future Needs

The District has hired a consultant to perform the evaluation of options for addressing the Compliance Schedule shown above. This effort is underway and includes:

- Collection of the background data regarding the treatment works including reports and technical information.

• Reviewing the performance of the WWTP in terms of capacity of the plant as a whole and each individual treatment process.

The capital improvement plan for the Weston FPA is shown in Table 5-111.

Table 5 - 111: Weston FPA Capital Improvement Schedule

Project	DMA	Total Cost	Annual Capital Improvement Needs						
			2025	2026	2027	2028	2029	2030	Future
WWTP Improvements	NWWSD	$2,200,000		$200,000	$1,000,000	$1,000,000			
Sanitary Sewer and Lateral Rehabilitation	NWWSD	$500,000			$500,000				
		$2,700,000							

Chapter 6: On-Site Sewage Treatment

I. Introduction

On-site sewage treatment includes the treatment and disposal of sewage on the same property as a household or commercial structure, rather than at a centralized (off-site) treatment plant. On-site treatment uses individual sewage treatment systems (STS); these systems should provide adequate and cost-effective removal of pollutants and pathogens from wastewater before sewage effluent enters ground or surface waters. On-site sewage treatment should do this in a way that avoids odor and other nuisance conditions.

Public health regulations are enforced at the local level by a Local Health District; all five counties in the TMACOG region have a Health District. Each district has a Board of Health which sets policy, approves its budget, and employs the Health Commissioner.

Septic tanks with soil absorption or leaching tile fields are the most common type of STS. This type of home sewage treatment has been in existence for several decades in both rural and suburban areas. The soil absorption system is not just a means to dispose of sewage effluent, but serves as part of the treatment process. A properly designed soil absorption system prevents discharge of pollutants. Older home sewage treatment systems (HSTS), in use where soil conditions do not permit a soil absorption system, include aerators and septic tanks followed by subsurface sand filters. Both types of systems discharge effluent to a stream or storm sewer. These technologies generally do not meet today's standards for protecting water quality. Newer designs that do meet the current standards include mound, drip, peat, and other technologies.

Effective January 1, 2015, the Ohio Department of Health (ODH) implemented new STS rules. These regulations set statewide standards for the design, operation, and maintenance of STS that include both HSTS and small flow on-site sewage treatment systems (SFOSTS), which provides service to more than one household. These systems do not require an EPA National Pollutant Discharge Elimination System (NPDES) permit because their design includes soil absorption systems as part of the treatment process, and do not discharge off-lot.

This chapter also covers small, privately owned sewage treatment plants also known as "semi-public" systems. This plan uses the colloquial term "package plant" to describe small, private wastewater treatment facilities based on how they are regulated rather than the technology they employ. Most of these systems are extended aeration treatment plants, which treat sewage at a business or development that is too large to be served by a septic system and does not have public sewers available. Generally, package plants are rated from 1,500 gallons per day (gpd) up to about 100,000 gpd. Private wastewater treatment plants include several types of systems — trickling filters, lagoons, or settling tank / surface filter. On-site effluent that has not been properly treated has been identified as a significant water quality issue in the TMACOG region. Sampling data indicate high bacterial counts in many suburban and rural waterways. Failed septic systems have been identified as a source of the contamination.

This chapter addresses several issues related to on-site sewage treatment systems in the TMACOG region:

1. A description of the problems of on-site sewage treatment in the TMACOG region;

2. Areawide policies affecting on-site sewage treatment;
3. Regulatory programs presently in effect or recommended;
4. Recommended improvements for existing programs;
5. Designation of critical sewage areas (CSAs).

II. Water Quality Impacts

Incompletely treated or raw sewage impacts ground and surface water quality in several different ways. Sewage contains high concentrations of three "pollutants"

- **Pathogens** threaten public health causing disease. The region had a history of water-borne typhoid fever and cholera before public sewerage systems came into use. Other waterborne diseases include dysentery, infectious hepatitis, and numerous others.
- **Phosphorus** is credited as the critical nutrient that resulted in eutrophication and algal blooms in Lake Erie in the 1960s and 1970s and drive today's harmful algal blooms (HABs). Water quality impacts of phosphorus on Lake Erie are discussed in more depth in **Chapter 7** titled "Agriculture, Drainage, and Habitat chapter of this Plan."
- **Nitrates** may contribute to Lake Erie's harmful algae blooms. At levels over 10 milligrams per liter (mg/L) nitrates make water unsafe for certain individuals to drink. Such concentrations of nitrates interfere with the body's ability to transfer oxygen, with a condition called Methemoglobinemia, or "blue baby syndrome." Infants are the most susceptible to nitrates.

Nitrogen and phosphorus in their various forms are classified as nutrients because they promote plant growth. Municipal and industrial wastewater effluents, urban stormwater runoff, and agricultural runoff all contribute significant nutrient loadings to Lake Erie and its tributaries. Refer to **Chapter 2** for a discussion of nutrients.

In 2013, ODH estimated there were one million HSTS in use statewide, with a failure rate of approximately 39% in northwest Ohio counties (ODH, 2013). A majority of the failures were due to age, lack of maintenance, poor soils, and lack of design standards. A small-scale study (approximately 200 systems) conducted by the Toledo/Lucas and Wood County Health Departments, coordinated by TMACOG in 2004, found test dye for about one-in-four STS (TMACOG, 2004).

On-site treatment system designs by the local health departments in the TMACOG region are required to have the soil analysis of the site that determines the type of HSTS that may be designed for the site. Sites that have suitable soils allow for a traditional soil-based treatment system with primary and secondary components. An example of a primary component would be the septic tank, and an example of a secondary component would be a soil-based system. Sites with limiting conditions, such as shallow soils or high seasonal perched water table require advanced treatment devices for these sites.

The septic tank provides primary treatment by settling out heavy solids (sludge) and trapping floating materials (scum). Solids retained in the septic tank have to be periodically removed by pumping. Limited biological treatment takes place in the tank through anaerobic bacterial action. Septic tank effluent enters the leaching tile field, where microorganisms in the soil provide final biological treatment and destroy pathogens. The leaching tile field is a series of distribution pipes laid in trenches to provide for soil absorption of the effluent from the septic tank.

The effectiveness and longevity of an on-site system depends on its proper design for site and soil conditions. With a preponderance of slow-draining soils and high-water tables in the region, systems can fail because of poor drainage or lack of maintenance. Before system installation, site review and soil evaluation are completed to determine the feasibility of a soil absorption treatment system. Feasibility of soil absorption depends on whether the soil distance between the leaching tile and a limiting layer (e.g., bedrock, hardpan, or water table) is adequate to treat the effluent.

On-site systems should not be permitted on new lots or new subdivisions where soil-based treatments are not feasible. Effluent discharges to surface waters may be permitted only for replacement systems where soil-based treatment is not feasible, and in compliance with NPDES requirements. New home sites require replacement sewage treatment system areas to be identified for on-site disposal.

III. Availability and Accessibility of Public Sewers

STS (including HSTS and SFOSTS) and package plants shall be abandoned and tapped when public sewers become available and accessible. The Ohio Administrative Code (OAC) Section 3701-29-06(I) states, "Whenever a sanitary sewage treatment system becomes accessible to a dwelling or structure served by a STS, the dwelling and/or structures shall be connected to the sanitary sewage system and the STS abandoned in accordance with rule 3701-29-21 of the Administrative Code."

The designation of an accessible sewer is determined by consultation with the Designated Management Agency (DMA) responsible for sewage collection. It depends on the distance between the sanitary sewer and the house or business that would be served, and whether there are any physical barriers that render connecting it to the sewer impracticable.

The availability of a sanitary sewer system is determined by the DMA and Ohio EPA/Michigan Department of Environment, Great Lakes, and Energy (EGLE). It depends on:

1. Whether the receiving sanitary sewer system has the capacity to transport and treat the additional sewage, and
2. Whether the sanitary sewer is a gravity sewer, an interceptor sewer, or a force main. Whether interceptors or force mains are available for tapping is a policy the DMA sets.
    - Sewers under the County Commissioners are accessible if within 200 feet of the foundation wall of the structure (Ohio Revised Code [ORC] 6117.51). Ohio Boards of Health may establish more stringent "accessibility" distance rules.
    - Under a Regional Water and Sewer District the rule is to "Require the owner of any premises located within the district to connect his premises to a water resource project determined to be accessible to such premises and found to require such connection so as to prevent or abate pollution or protect the health and property of persons in the district. Such connection shall be made in accordance with procedures established by the board of trustees of such district and pursuant to such orders as the board may find necessary to ensure and enforce compliance with such procedures" (ORC 6119.06).

- In Michigan, state law authorizes local governments to require connection to a public sewer.

It is the policy of this Areawide Water Quality Management Plan (AWQMP) that,

1. No private sewage treatment system shall be installed, maintained, or operated on any property accessible to a public sanitary sewage system.
2. For the purposes of this Plan, “accessible to a public sanitary sewage system” means
    a. The DMA (see **Chapter 4** for definition and list) responsible for public sanitary sewers in the Facility Planning Area (FPA) will grant permission to connect to their system, and
        i. A connecting point to the public sewer from the foundation wall of any structure with plumbing drains along the shortest direct line distance is within a specified distance. That specified distance is 200 feet unless a different figure is given in Table 6-1 of individual criteria for each county, or
        ii. Ohio EPA or Michigan EGLE has determined that a public sanitary sewer is available, considering the distance to the sewer, physical barriers, ability of the sewage system to transport and treat the wastewater, cost effectiveness, overflows from the sewer system, or other environmental or public health issues, or
        iii. The FPA has a policy that new subdivisions shall be required to connect to the public sanitary sewage system and may not be served by septic systems or package plants. This policy applies only to individual FPAs where the DMAs have requested it. Please see the individual FPA Descriptions in **Chapter 5** of this Plan.

Table 6 - 1: Locally Established Criteria for “Accessible” Public Sewers

County	Criteria
Lucas County, Ohio	Uses policy of jurisdiction responsible for sewers.
Monroe County, Michigan	State Law authorizes local governments to require connection to a public sewer.
Ottawa County, Ohio	Existing residences must tie into an available gravity or pressure sewers.
Sandusky County, Ohio	Must tap into an available public sanitary sewer that the Board of Health has determined to be accessible. The Board of Health will make a determination on a lot-by-lot basis, depending on DMA’s accessibility assessment, 208 Facility Planning Area, whether the site is in a Critical Sewage Area, density of housing units, and environmentally sensitive areas.
Wood County, Ohio	In its 2015 Supplemental Rule Package, the Wood County Board of Health re-established a more stringent standard of 400 feet for the DMA to determine whether a sanitary sewer is available and accessible.

Availability of Pressure Sewers and Force Mains

While Ohio law on availability is the same for gravity sewers and force mains, there are practical aspects that distinguish them. Whether interceptors or force mains are available for tapping is a policy the DMA sets. This 208 Plan recommends availability of connection to a pressure sewer or force main be based on criteria that include:

1. Whether sewer service is consistent with an adopted land use or comprehensive plan and may be used to preserve habitat or natural areas, limit sprawl development, or minimize pollution from stormwater runoff. If sewer service is not consistent with a land use plan, the force main should not be included within an FPA. Sewer availability based on land use should result from a consistent policy of where development should or should not occur. It should not be used arbitrarily to favor or disfavor a particular type of business.
2. Pressure sewer systems, designed to receive flow from grinder pumps, should normally be considered available for taps, unless there is a barrier or restriction.
3. Force mains, where the pipe and pumping system were designed to accept flow from grinder pumps, should normally be considered available for taps, unless there is a barrier or restriction.
4. Force mains, where the pipe and pumping system were not designed to accept flow from grinder pumps, may be available up to the flow and head capacity of its pumping station(s). An additional consideration is whether a precedent has been set for accessibility by allowing taps in the past.
5. Force mains may be tapped on a case-by-case basis, subject to approval by the DMA, on an emergency basis, especially to eliminate failed on-site systems where a replacement system is not feasible.
6. Where a force main is outside any FPA, it should be considered available per local health district regulations (e.g., the 200-foot rule), provided the force main has capacity and the DMA approves service connections unless a physical barrier renders tapping infeasible. Contractual or ownership restrictions may also render a force main inaccessible. In such a case where service is extended outside an FPA boundary, the boundary should then be amended to include the served area.

Subdivisions and New Lots

In areas where a sanitary sewage system is accessible, the policy of this Plan is that new on-site systems shall not be permitted. For proposed subdivisions of more than 25 lots, on-site sewage systems may be approved only with written documentation from Ohio EPA that a sanitary sewer is not accessible. A board of health may establish a policy to require this rule to smaller subdivisions. OAC 3701-29-08(B) (6) states:

(B) Any person proposing a subdivision or new lot(s) for review by the board of health shall submit an application and sufficient information to determine compliance with the requirements of this chapter. Minimum information to be submitted or completed for review shall include the following:

(6) When a proposed subdivision includes the creation of at least twenty-five lots, or for any fewer numbers of lots as required by the board of health, the request shall include written consultation from Ohio EPA concerning the subdivision's accessibility to existing sanitary sewerage systems as described in paragraph (I) of rule 3701-29-06 of the Administrative Code, and risks to surface and ground water resources.

Household sewage systems with off-lot discharges (i.e., requiring NPDES permits) are prohibited on new lots or lots in subdivisions. This Plan recommends siting restrictions for new and replacement sewage systems within:

- Floodways and 100-year floodplains
- Wetlands
- Isolation from public water system wells
- Areas with unsuitable site and soil conditions, such as exposed bedrock, steep slopes and filled/disturbed areas where soil conditions may not be adequate to provide treatment.

It is required in Ohio that boards of health review proposed subdivisions for any restrictions on the use of onsite sewage systems and consult with appropriate DMAs to determine accessibility of sanitary sewers, and the TMACOG 208 Plan.

IV. Statewide Regulations

Many policies and system design criteria are set by state regulation, in OAC §3701-29 or Michigan Compiled Laws Chapter 3. The county board of health implements state regulations and may exercise options allotted to it by the regulations. Note the discussion of "semi-public" sewage treatment systems under OAC below. Policies that apply to residential septic systems under OAC do not apply to semi-public septic systems. Many policies that apply to HSTS also apply to SFOSTSs. Statewide policies are outlined in Table 6-2.

Table 6 - 2: On-site Sewage System Policies and Criteria

Septic System Policy	Ohio	Michigan
	In addition to isolation distances, the lot is required to have room for a complete replacement system.	In addition to isolation distances between septic system and wells, waterways, and structures, the lot is required to have room for a complete replacement septic system
Household sewage treatment design criteria	The local boards of health utilize the Ohio Administrative Code 3701-29 for the review and installation of household sewage treatment systems.	Section 504 of the Monroe County Sanitary Code covers location, accessibility, and size of tank(s), effluent filter, and subsurface disposal system design.
Off-lot effluent discharge	The local boards of health utilize the Ohio Administrative Code 3701-29 for the review and installation of household sewage treatment systems.	Health Department may block off discharges of untreated sewage following posting of at least 5 public notices for at least 30 days.
Home aerators	The local boards of health utilize the Ohio Administrative Code 3701-29 for the review and installation of household sewage treatment systems.	Mechanical sewage treatment systems must be approved before installation. Approval requires a current maintenance contract and a performance bond.
Sewage system operation and maintenance and inspections	The local boards of health utilize the Ohio Administrative Code 3701-29 for the review and installation of household sewage treatment systems.	Inspection and approval by health officer before covering distribution tiles is required before a sewage treatment system may be put into use. Minimum (statewide) program requirements include evaluation of existing onsite sewage systems. Each year the county health department inspects existing systems equal to 10% of the sewage permits issued the previous year. In 1999 evaluations were conducted at home where the property owner requested other

Septic System Policy	Ohio	Michigan
		services, such as well inspections, FIA evaluations, proposed swimming pools, or additions to the home. Of 56 systems evaluated, 52 were found to be functioning properly at the time of the study (Monroe County Health Department, 2000). Monroe County Sanitary Code §501.08 requires private sewage disposal systems to be maintained in satisfactory operating condition at all times. Septic tanks are required to have sludge pumped out as necessary to prevent carry-over of solids into the leaching field.
Abandonment	The local boards of health utilize the Ohio Administrative Code 3701-29 for the review and installation of household sewage treatment systems.	Tank must be emptied and filled to ground surface with suitable material
Variances	The local boards of health utilize the Ohio Administrative Code 3701-29 for the review and installation of household sewage treatment systems.	
Land application of septage	The local boards of health may allow application land application of septage under state criteria per the Ohio Administrative Code 3701-29.	If source of septage is within 15 miles of a public septage waste treatment facility, the septage must go that facility. U.S. EPA “503” regulations apply as well.

Note: OAC regulations apply only to septic systems under the jurisdiction of local health departments and not to septic systems that are classified as “semi-public” because they serve businesses. Refer to Monroe County Sanitary Code: Chapter 5, Sewage Disposal, March 2001.

Types and Regulation of Sewage Systems

Regulation of on-site sewage systems in Ohio is divided among the ODH and Ohio EPA at the state level, and boards of health at the local (county) level. Responsibility for permitting and administering sewage systems depends on the size of the system, and whether it discharges treated effluent (Table 6-3). These rules apply only to sewage systems permitted on or after January 1, 2007.

In Michigan, state law stipulates that the municipality may be required to assume responsibility for managing the system (section 3109 of Part 31 of Michigan Public Act 451 of 1994) (SEMCOG, 1999).

NPDES General Permits for Discharging Sewage Systems

Ohio sewage regulations permit new or replacement discharging of 1, 2, and 3-family residential systems, only subject to the requirements of an NPDES permit. Ohio EPA has issued a General Permit that applies to all such systems. Its provisions include:

- A discharging system is permitted only for replacement sewage systems where soil absorption is not feasible, or for new systems on lots created before January 1, 2007 where soil absorption is not feasible.
- A discharging system is permitted only where public sewers are not available and accessible.
- A discharging system is not permitted where that discharge would conflict with a 208 Plan.
- A sewage system is ineligible for the NPDES General Permit if it is within 400 feet of a public sewer, and that sewer has capacity to accept the sewage system's flow.
- Effluent sampling and reporting is required annually. Effluent standards are 18 mg/L total suspended solids, 2.0/4.5 mg/L ammonia summer/winter, 15 mg/L $CBOD_5$, and 126 colonies *Escherichia coli* (summer).
- Local boards of health may administer the permitting and management of NPDES General Permit sewage systems through a Memorandum of Understanding with Ohio EPA.

Table 6 - 3: On-site Sewage Systems in Ohio: System Types and Regulatory Responsibility

System type	Defining criteria	Size (gallons per day treatment capacity)	Effluent discharge	Regulatory agencies
Home sewage treatment system (HSTS)	Serves a 1-, 2-, or 3-family residential dwelling.	No criterion: determined by capacity of soil to absorb and treat effluent.	None: soil absorbs and treats the effluent.	ODH and local board of health
Discharging HSTS	Serves a 1-, 2-, or 3-family residential dwelling Permissible only (1) where onsite soil absorption is not an option, and (2) replacement systems or new systems on lots created before 1/1/07.	No criterion, but limited to 1-, 2-, or 3-family residential units.	Effluent is discharged off site. New or replacement systems are subject to NPDES requirements. Discharges that existed prior to 2007 are not covered by the Ohio EPA General Permit at this time. Discharging systems may be required to upgrade on property transfer or other inspection, complaint, or in	The local health district signs a Memorandum of Understanding with Ohio EPA. The local health district may assist homeowners with access to HSTS General NPDES Permit coverage.

System type	Defining criteria	Size (gallons per day treatment capacity)	Effluent discharge	Regulatory agencies
			compliance with Stormwater Phase II NPDES “illicit discharge detection & elimination” requirements.	
Small Flow On-site Sewage Treatment System (SFOSTS)	On-site sewage system not qualifying as a “household” system because it serves more than a 1-,-,2-,, or 3-family dwelling or a dwelling with a home business.	Less than 1,000 gallons per day.	None: soil absorbs and treats the effluent.	Local Board of Health may assume authority for SFOSTSs.
Commercial STS (HSTS or SFOSTS)	Non-residential structure.	Less than 1,000 gallons per day.	None: soil absorbs and treats the effluent.	Ohio EPA
Semi-public disposal system (“package sewage treatment plant”)	Sewage treatment system not served by a public sewerage system, and where soils will not accommodate an onsite system. Most are extended aeration treatment plants.	Less than 25,000 gallons per day.	Treated effluent is usually discharged offsite to a stream or storm sewer. Effluent quality is subject to regulation under NPDES requirements.	Ohio EPA; local board of health may contract with Ohio EPA to assume oversight of semi-public systems.
Larger package plants	Same as semi-public package plants, but larger.	25,000 gallons per day or greater.	Treated effluent is usually discharged off-site to a stream or storm sewer. Effluent quality is subject to regulation under NPDES requirements.	Ohio EPA

On-Site System Policies set by Local Boards of Health

Septic systems serving 1, 2, or 3-family residences are regulated by county boards of health. Sewage treatment systems serving commercial establishments or residences with more than three families are regulated by Ohio EPA, described in the next section. Regulatory authorities for different types of sewage systems are given in the table above. Some authority may be assumed by local boards of health following agreements, commitments, or contracts. Table 6-4 summarizes policies established by boards of health in the TMACOG region.

Table 6 - 4: Sewage System Management Policies of Ohio Boards of Health

County	Memorandum of Understanding (MOU) with Ohio EPA for discharging HSTS	Contract with Ohio EPA for semi-public systems	Letter of commitment to assume authority for SFOSTS systems
Lucas County	Yes	Yes	Yes
Ottawa County	Yes	No	No
Sandusky County	Yes	No	No
Wood County	Yes	No	No

Table 6-5 provides policies for off-lot discharging system designs. Many such systems were approved under Ohio sewage regulations prior to 2007. These systems still exist and continue to be used. Off-lot discharging systems are now allowed in Ohio only as replacement systems where soil absorption is not feasible, and these systems are subject to NPDES permitting requirements.

Policies

- All STSs must be properly operated and maintained in order to protect water quality and public health.
- Conduct research and demonstration projects to determine what designs work the best long term in heavy silt/clay, shallow bedrock, and/or high groundwater soils.
- This Plan supports financial assistance to upgrade on-site systems with either a grant or cost-share basis. Existing programs through U.S. Department of Agriculture (USDA), Housing and Urban Development (HUD) or the U.S. EPA State Revolving Fund (SRF) programs have too little funding and too many qualifying restrictions to meet needs. This Plan supports the development, expansion, and regularization of financial assistance to repair, replace, or upgrade onsite systems. Funding criteria should include financial need and effectiveness in reducing water pollution and public health nuisances.

Sewage System Management Issues

A primary reason why on-site sewage systems are not working properly, especially pre-2007 tanks and aeration systems, is because of lack of maintenance. The 2015 rules require that all new systems to be covered by an operations & maintenance (O/M) program through the local health district. Over time, these programs will be extended to cover all systems. The useful life of a HSTS may be 20 to 30 years if properly maintained. The primary causes of failure are soil clogging and hydraulic overload. Annual maintenance helps prevent HSTS failure and may extend the life of the system. As a broad average, septic tanks should be pumped about every three to five years. Pumping frequencies depend on the number of people in a house, size of tank, and whether or not there is a garbage disposal. A septic tank needs pumping when it has one-third each of scum/grease, liquid, and sludge. Recommendations by The Ohio State University Extension (ODH, 2001) are provided in Table 6-6.

Table 6 - 5: Sewage System Policies

County	Homeowner servicing HSTS	Homeowner installing HSTS	Vertical separation distance		6-18" to limiting layer	Permit required
Lucas	Waiver subject to registration with county, bond, liability insurance, continuing education	Waiver subject to registration fee, liability insurance, and bond	6 inches	0 inch	No	
Monroe						
Ottawa	Waivers not available	Waivers not available	6 inches	1 inch	Yes	
Sandusky						
Wood	Homeowner must pass certification test and pay fee; CEUs not required	Homeowner must pass certification test and pay fee; CEUs not required	6 inches		Yes	Yes

Table 6 - 6: Recommended Septic Tank Pumping Frequencies (Years)

Tank Size (gal)	Household Size (Number of People)							
	1	**1**	**3**	**4**	**5**	**6**	**7**	**8**
750	9.1	4.2	2.6	1.8	1.3	1.0	0.7	0.6
1000	12.4	5.9	3.7	2.6	2.0	1.5	1.2	1.0
1250	15.6	7.5	4.8	3.4	2.6	2.0	1.7	1.4
1500	18.9	9.1	5.9	4.2	3.3	2.6	2.1	1.8
1750	22.1	10.7	6.9	5.0	3.9	3.1	2.6	2.2
2000	25.4	12.4	8.0	5.9	4.5	3.7	3.1	2.6
2500	31.9	15.6	10.2	7.5	5.9	4.8	4.0	4.0

*Note: Based on year-round residences. More frequent pumping needed if garbage disposal is used.

Septage Disposal

Septage from domestic septic systems is subject to U.S. EPA "Part 503" sludge regulations. Removal and disposal of solids and liquids (septage) from septic tanks poses a final problem for on-site septic systems. Septage treatment and disposal options include:

- Discharge to a municipal wastewater treatment plant that is designed to treat septage.

In limited cases (Table 6-7), apply to agricultural land for agronomic benefit U.S. EPA, some wastewater plants accept septage, but most do not. Because septage is septic, and a high-strength waste, some treatment plants are not able to accept it. There is a lack of plants with septage handling facilities in northwest Ohio. Current septage policies are provided in the following table.

Table 6 - 7: Septage Handling Facilities in Northwest Ohio

County	Health Department's Septage Land Application Policies & Practices	Wastewater Plants that Accept Septage
Lucas	Land Application is prohibited	Toledo, Oregon
Monroe	Land application acceptable; Michigan EGLE issues permits	None in Bedford, Erie, or Whiteford Townships
Ottawa	Land application is prohibited	None
Sandusky	Land application is prohibited	Bellevue, Fremont
Wood	Land application is prohibited	Bowling Green, Fostoria, Perrysburg

Recommendations

More septage receiving capacity is needed at public wastewater treatment plants. POTWs do not have a responsibility to accept septage; therefore, better incentives are needed to encourage them to accept it. One possible source is Ohio EPA's Division of Environmental & Financial Assistance (DEFA), which offers low-interest loan incentives. Privately owned septage pre-treatment facilities may become available in the area. Please see **Chapter 5**, section on "Privately-Owned Septage Pretreatment Facilities" and individual FPA descriptions for policy discussion and details.

Installer, Service Providers, and Septage Hauler Registration and Training

Private companies provide on-site sewage system services for installation, operation, and maintenance. The 2015 Ohio sewage rules described in OAC 3701-29-03 set statewide regulations and standards for registration, bonding, and training.

Small Flow On-site Sewage Treatment Systems

In 2015, Ohio sewage regulations established SFOSTS as a category of STS. SFOSTS are similar to HSTS in many ways: they may serve residences or businesses, treat 1,000 gallons of sewage per day, and are regulated by Ohio EPA or the local health district. See OAC 3701-29-01 for the definition of small flow on-site treatment systems.

V. Package Plants

Larger privately-owned sewage treatment devices with discharges of treated effluent are "semi-public" if they treat less than 25,000 gpd. These systems, described below, are colloquially known as "package plants." Regulation is the responsibility of Ohio EPA. More than half such systems do not have NPDES permits. As a "semi-public" system, a board of health may assume monitoring duties under a "House Bill 110" contract with Ohio EPA.

Ohio EPA has historically given priority to the issuance of NPDES permits to larger package plants: those discharging more than 25,000 gpd. As of April 2019, 91% (21 of 23 active package plants over 25,000 gpd) had individual NPDES permits in the TMACOG region, while 67% (75 out of 112 active package plants) smaller than 25,000 gpd have NPDES permits. Overall, TMACOG region has 135 active plants, of which 96 (71%) have NPDES permits (Table 6-8). Package plants have become much less common in northwest Ohio over the years. Ohio EPA has permitted far fewer package plants, and DMAs have been very active in extending sewers to eliminate existing plants. For example, in 1984, there were 355 package plants in the same five counties, 36 (10%) with NPDES permits; there were 57 package plants over 25,000 gpd, of which 26 (42%) had NPDES permits (TMACOG, 1984).

Extended aeration is a biological treatment process that grows a culture of aerobic microorganisms (activated sludge) to digest the organic matter in sewage. An extended aeration plant has an aeration chamber where activated sludge and raw sewage are mixed with air to promote digestion. The plant has a settling chamber as well. Clear, treated water flows over a weir and out of the plant; activated sludge settles to the bottom and is pumped back to the aeration tank.

Extended aeration plants–as they have been designed over the last 40 years–come in numerous variants, depending on design requirements at the time. Common facilities include:

- Trash trap —a septic tank preceding the plant to remove settleable and floatable solids
- Chlorination — disinfects treated wastewater; usually a plastic tube that feeds slow-dissolving chlorine tablets as needed.
- Dechlorination — Removes residual chlorine from effluent after disinfection is done. Mechanically, a de-chlorinator is similar to a chlorinator. These devices came into common use in the late 1990s.
- Filter — a sand bed that filters remaining solids out of treated effluent
- Some larger extended aeration plants have an aerobic sludge digestion/sludge holding tank

Table 6 - 8: Package Plant Statistics

County	Total Package Plants	Package Plants with NPDES Permits	Package Plants in Use
Lucas	23	12	21
Monroe	5	5	5
Ottawa	53	41	49
Sandusky	39	23	34
Wood	25	14	25
Totals	**145**	**95**	**134**

Note: Data are based on current available data as of April 2019. Monroe includes Erie, Bedford, and Whiteford Townships.

Ohio EPA and Michigan EGLE are responsible for permitting package plants. For a new package plant to be permitted, the application must go through the anti-degradation review process and demonstrate that there is no other sewage treatment method available. That means a septic system will not be adequate, and that public sewers are not available. Whether a proposed package plant may be built in an unsewered part of a FPA is determined in **Chapter 5** of this Plan. They may be accepted or denied as a policy of each FPA. Presently all FPAs accept temporary package plants where public sewers are not available. Unless stated otherwise, package plants may be permitted where public sanitary sewers are not available and accessible.

Most small privately-operated wastewater plants are extended aeration systems discharging treated effluent to a stream, ditch, or storm sewer. Some plants, especially those of older design, use other treatment processes. Examples include:

! Settling tank with surface sand filter (Imhoff treatment plant)

! Trickling filter

! Wastewater lagoon

The equipment for these systems is different than extended aeration plants, but the management issues are identical. For that reason, these systems should be considered as "package plants" for the purposes of this Plan's policies.

Package Plant Constraints and Issues

Modern package plants are fundamentally sound sewage treatment equipment; their problems rise almost entirely out of operation, maintenance, and management issues. Because many package plants are not operated and maintained properly, it is a requirement of this 208 Plan that they be abandoned wherever public sewers are available and accessible.

Package Plants Outside Facility Planning Areas

Package sewage treatment plants located within FPAs are described in **Chapter 5** of this Plan. Package plants not within any FPA boundary are listed in Table 6-9.

Policies

- Package plants shall be required to tap into public sewers when sewers become available and accessible, regardless of the age, condition, or design capacity of the package plant. New package plants shall be permitted only on this condition.
    - Most unincorporated areas are covered by ORC §6117 which defines "available" as 200 feet from the foundation of the building to the edge of the sewer right of way. Wood County regulations use 400 feet, subject to confirmation of availability by the DMA. In areas covered by Regional Water and Sewer Districts, *"…require such connection so as to prevent or abate pollution or protect the health and property of persons…".* In Michigan, State Law authorizes local governments to require connection to a public sewer.
- Package plants should be available as a sewage treatment option for subdivisions where public sewers are not available, except where disallowed by the policy of the FPA (see **Chapter 5**). In such

cases, a properly operated and maintained package plant may be better environmentally than individual septic systems. Such a package plant should include two provisos:

- The package plant is owned and operated by the County Sanitary Engineer (Ohio), Drain Commissioner (Michigan), a municipality with qualified staff, or Regional Water and Sewer District. (Ohio).
- The plant has an NPDES permit and meets its effluent requirements.

Package Plant Management Issues

Ohio House Bill 110

While HB 110 allows boards of health to inspect semi-public systems, enforcement remains with the State through the Attorney General's office. Enforcement of fee collection also remained with the State. The board was not able to collect sufficient fees to run the program.

Table 6 - 9: Package Plants Not in Any Facility Planning Area

Package Plant	Map ID	Township	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Package Plants in no FPA for Lucas County						
Karl's Trading Post[I]	LU-34	Providence	Private*	1977		5,000
Pradco[I]	LU-32	Providence	Private*	1966		1,000
Butch and Denny’s Bait Shop[A]	LU-02	Jerusalem	Private*			1,500
Cooley Canal Yacht Club[A]	LU-03	Jerusalem	Private	1969	2PR00293	1,000
East Side Auto Sales[A]	LU-04	Jerusalem	Private*	1974		2,000
Lake Erie Lodge[A]	LU-114	Jerusalem	Private	1988		15,000
Scarlett Route 2[I]	LU-07	Jerusalem	Private		2PR00289	7,000
Wolf Creek Sportsman’s Assoc.[A]	LU-12	Jerusalem	Private	1965		2,000
Package Plants in no FPA for Monroe County						
Pilot Travel Centers[A]	MO-07	Whiteford	Private*		MIG580303	9,863
Package Plants in no FPA for Ottawa County						
Allen Park Mobile Court[A]	OT-02	Allen	Private*	1958		5,000
Wayside InnI	OT-07	Benton	Private*	1975		3,500
Elmore Ohio Turnpike Maintenance Building[A]	OT-134	Harris	Private*	1989		2,500
Camp Sabroske[A]	OT-09	Carroll	Private	1966	2PRT00197	4,000
Carroll Elementary School[A]	OT-127	Carroll	Private*	1961		10,000
Happy Hooker[A]	OT-132	Carroll	Private*	1988		5,000
Paradise Acres Camp & Pool[A]	OT-14	Carroll	Private	2003	2PR00192	31,500
Toussaint River Marina[A]	OT-114	Carroll	Private	1985	2PR00155	6,000
Porky's Pizza Trough[A]	OT-129	Carroll	Private	1988	2PR00259	9,000
Materion Brush[A]	OT-124	Harris	Private		2EI00000	30,000

Package Plant	Map ID	Township	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Green Valley Trailer Park[A]	OT-74	Harris	Private	1968	2PY00059	9,000
Rattlesnake Island Club Subdivision[A]	OT-131	Put-in-Bay	Private*	1991	2PR00290	15,000
Package Plants in no FPA for Sandusky County						
Misty Meadows Camp[A]	SA-03	Ballville	Private*	1982		6,300
O'Flaherty's, Patrick J.[I]	SA-04	Ballville	Private* 2001	1973		9,000
Whirlpool Park Clubhouse[I]	SA-60	Green Creek	Private*	1955		4,500
Adam's Acres Subdivision[A]	SA-14	Jackson	Public	1977	2PG00082	35,000
Rollersville Tavern[A]	SA-64	Madison	Private*	1990		3,500
Apollo Trailer Park[A]	SA-22	Rice	Private	1971	2PY00062	15,000
Fremont Plastic Mold[A]	SA-25	Rice	Private	1982	2PR00186	4,000
Cuyahoga Heights Commerce One[A]	SA-39	Rice	Private	1970	2IN00252	18,000
Bayshore Country Inn[I]	SA-62	Riley	Private*	1990		3,000
Erie Island - Commodore Perry Service Plaza[A]	SA-32	Riley	Public	Before 1961	2PQ00001	150,000
General Cutlery[A]	SA-31B	Riley	Private*	1973		12,500
General Cutlery[I]	SA-31A	Riley	Private*	1947		3,600
Vickery Environmental[I]	SA-33	Riley	Private*		2IN00016	2,500
Lakota Elementary & High School[A]	SA-43	Scott	Private	2009	2PT00053	15,000
M&M Tavern[A]	SA-44	Townsend	Private*	1972		3,000
Townsend Elementary School[A]	SA-45	Townsend	Private*	1973		7,000
Winding Lakes Trailer Park[A]	SA-46	Townsend	Private*	1971, 1986		5,000
Next Level Auto[A]	SA-48	Washington	Private*	1986		5,000
Roots Poultry[A]	SA-67	Washington	Private*	1993		5,000
Sycamore Hills Golf Course[A]	SA-51	Washington	Private	1992	2PR00193	7,500

Package Plant	Map ID	Township	Type	Install or Upgrade Date	NPDES Permit	Capacity, gpd
Carmeuse Lime Millersville[A]	SA-56	Woodville	Private*	1957	2IJ00032	3,000
Rockwell Springs Trout Club[A]	SA-69	Townsend	Private		2PR00265	8,000
Buckeye Acres Campground[A]	SA-68	York	Private	2012	2PR00282	
Gibsonburg Travel Truckstop[A]	SA-66	Washington	Private*	1997		1,500
Westwood Subdivision[A]	SA-05	Ballville	Public	1973	2PG00023	20,000
Package Plants in no FPA for Wood County						
Country Side MHP[A]	WO-41	Liberty	Private	1988	2PY00071	8,000
South Shore Farm[I]	WO-51	Montgomery	Private*	1975, expansion		25,000
Perrysburg Estates MHP, SS #5[A]	WO-61	Perrysburg	Private	Expanded 1991?	2PY00014	25,00
Village Green Mobile Home Park[A]	WO-62	Perrysburg	Private		2PY00008	45,000
Elmwood Local Schools[A]	WO-68	Portage	Private	2003	2PT00038	30,000
Ohio State Patrol Weigh Station[A]	WO-104	Portage	Private*			1,500

[A]Status is active; [I]Status is inactive

*Facility type is assumedNote: Data are based on current available data as of April 2019. Monroe includes Erie, Bedford, and Whiteford Townships.

VI. Areawide Policies

This section establishes policies and recommends practices to provide on-site sewage treatment that protects water quality and public health.

1. Boards of Health shall administer local on-site sewage treatment regulations pursuant to the OAC 3701-29. The Monroe County Health Department shall administer the Monroe County Sanitary Code.
2. The TMACOG Water Quality Council shall maintain the On-site Sewage Treatment Chapter with a list of Best Management Practices (BMPs) and recommended policies. Each management agency shall be responsible for its own list of practices to be included in 208 Plan updates.
3. The Boards local boards of health should:
    a. Coordinate its regulations and policies with the other agencies, including land use planning, capital improvements programming, and public wastewater treatment to prevent the installation of home sewage systems in unsuitable areas.
4. The TMACOG Water Quality Council shall:
    a. Work to implement the creation of on-site waste management districts responsible for planning, design, installation, operation, and maintenance, and monitoring of on-site systems within sub-county or given problem areas.
    b. Support the periodic updating of soil surveys.
    c. Seek new improved legislation from the Ohio Legislature as detailed in the Recommended Implementation Activities section at the end of this chapter.
    d. Support long-term research on effective and practical STSs for the soil conditions of our region.
5. The Water Quality Council and the management agencies shall work together to improve the programs for home sewage treatment in accordance with the recommendations of this chapter.

This Plan supports the goals and recommendations of Ohio DNR's *Ohio Coastal Nonpoint Pollution Control Program Plan,* submitted to NOAA Regional.

VII. Regulatory Programs

Existing Programs
The State of Ohio requires that all counties enforce HSTS regulations, covered in OAC 3701-29, described earlier in this chapter. The Boards of Health administer the regulations and have the power to abate nuisances. The Boards of Health may petition the Court of Common Pleas for injunctive relief against a nuisance and may also abate the nuisance, with cost charged to the owner, or a lien set against the subject property. Provisions are made for a hearing prior to enforcement action.

Monroe County Sanitary Code regulations are of similar scope and design with a few differences.

Subdivisions, Package Plants, and On-site Systems

Centralized sewage systems shall be given first consideration for sewage treatment in residential subdivisions. Connection to an existing treatment plant is preferred, with construction of a package treatment plant the secondary alternative. If a sewage collection system is not available and accessible, and a package treatment plant is not feasible in the judgment of Ohio EPA, the local Board of Health may allow an on-site treatment system, except as prohibited by individual FPAs. As indicated below, there are variations among the county subdivision regulations pertaining to sewage treatment requirements. According to each county's subdivision regulations, package treatment plants must be constructed by the developer of a subdivision, and then deeded to the respective county.

Some Facilities Planning Areas (**Chapter 5**) require new residential subdivisions to be served by that FPA's public wastewater treatment plant, not package plants, or on-site systems. See the following FPAs for more information:

- Bellevue
- Clyde
- Fremont

Over the past 20 years the practice has been to eliminate package plants wherever possible and resist permitting new ones. Package plants are viewed as maintenance problems by the County Sanitary Engineers and ineffective sewage treatment facilities by Ohio EPA and the health departments because they are generally neglected. New package plants have been installed for rural businesses; they are rarely permitted for suburban or rural subdivisions.

Complaint Procedure for Untreated Sewage in Waters of Ohio

Ohio Revised Code (ORC) and Administrative Code (OAC) set procedures for reporting cases where untreated sewage is contaminating public waterways. ORC §6111.05 requires Ohio EPA to investigate when it receives a written complaint. A complaint filed under ORC §6117.34 must include a resolution adopted by the Township Trustees and/or Board of Health.

ORC §6117.34 describes a more rigorous complaint procedure applicable to unincorporated areas, and is recommended for Health Departments. Such a complaint should be sent to the Ohio EPA District Office and follow procedures set in OAC 3745-1-04(F), summarized below:

- Detailed documentation of unsanitary conditions, visual (black water or sludge, gassing or grayish white water, toilet paper), odor (sewage smell), and data (fecal coliform or *E. coli*).
- Bacterial tests conducted under the supervision of Ohio EPA or a registered sanitarian should include at least two sample runs. The samples must be collected at least two hours apart but within 30 days of each other. The samples are to be collected when stream flow is in a steady state dry weather condition. Bacterial standards defining a violation of water quality standards are (OAC 3745-01-04):
    - More than 5,000 fecal coliform/100 ml in two or more samples when five or fewer samples are collected; or in more than 20% of samples when more than five are collected.
    - More than 576 *E. coli*/100 ml in two or more samples when five or fewer samples are collected; or in more than 20% of samples when more than five are collected.

VIII. Financial Assistance

This Plan encourages the use of financial assistance programs to upgrade or replace STSs. This Plan supports funding for these programs through federal, state, regional, and local agencies.

USDA Rural Development

USDA/RD "Section 504" funds may be used for home repairs to remove health and safety hazards. One such use is to upgrade or replace home sewage systems. Section 504 funding may be available as a loan, or a grant/loan combination. Financial need is a requirement in all cases. Grants may be available to those 62 years of age or more, and unable to repay a Section 504 loan. Funding under this program is available only in rural areas. Applications are made through USDA district offices.

HUD Community Development Block Grant

The Community Development Block Grant (CDBG) Community Housing Improvement Program (CHIP) may be used to upgrade or repair housing for low- and moderate-income households. Sewage system upgrades and sewer taps are among the eligible housing improvements. The initial application is made by a local jurisdiction, which then administers grants to residents. Counties are the applicant for unincorporated areas; "non-entitlement" cities and villages under the Block Grant regulations may also apply. Households must qualify as "low to moderate income" under HUD rules.

Ohio EPA Water Pollution Control Loan Fund

Individual residents may qualify for grants, loans, or other financial assistance through the Ohio EPA's Water Pollution EPA's Water Pollution Control Loan Fund for current assistance programs.

Clean Michigan Initiative: Failing Onsite Septic System Grants

Michigan EGLE administers this grant program to identify failing onsite septic systems and/or implement corrective measures. This funding may replace failed septic systems with sewer extensions or treatment facilities. It does not pay for repairing or replacing failed septic systems. Funding is limited to the amount appropriated to it for any given year. The funding source is the Clean Michigan bond fund.

IX. Recommended Implementation Activities

1. Better coordination of planning, design, and installation of STSs among governmental agencies.
2. More consideration and use of technical alternatives to traditional STSs where physical conditions warrant.
3. More specific enabling legislation at the state level to allow improved enforcement of proper maintenance.
4. Better administration at the local health department level of STSs.
5. Improved education and information for homeowners on the proper operation and maintenance of onsite sewage systems.

Coordination of Planning, Design and Installation

- Health regulations for STS should be coordinated with existing county land use policies and controls, including zoning and subdivision regulations. Lot splits should be coordinated with health and home sewage regulations, soils information, drainage and capital improvement plans.
- As part of the lot split review procedure, a recommendation on suitability of the site for sewage disposal from the county health department is required.

On-site System Design Alternatives

Septic tank-soil adsorption systems are just one type of onsite sewage treatment. Other STSs may be used on a site with restrictions due to soil conditions. This plan's recommendation is to use passive sewage systems preferentially over mechanical treatment systems where site conditions allow. Passive systems, where soil adsorption provides the final effluent treatment and disposal, require the least amount of service and maintenance vs. STS with mechanical components. While mechanical systems are not the preferred alternative, they are allowable under state law, and subject to proper operation and maintenance of the mechanical equipment.

Table 6 - 10: Recommended On-site System Flow Reduction Techniques

Flow Reduction Techniques
Standard plumbing fixtures
Water conservation shower heads
Water conservation toilets

State-Enabling Legislation

- OAC 3701-29 requires all STSs to be covered by o/m permits issued by the local Board of Health for the life of that system.
- Each local health district should charge fees for o/m permits that cover the cost of administering the program. The homeowner and service provider are responsible for providing a copy of the service contract and reports to the Local health district on District an annual basis for STSs requiring a service provider. Local boards of health have the ability to conduct inspections and charge fees for those inspections.
- Clarification is needed between the roles and responsibilities of Ohio EPA and the ODH in responsibility for onsite systems. These two agencies split their enforcement authority with package plant systems depending upon the size of the plant. The capability of one of these state agencies needs to be expanded to ensure that local boards of health effectively manage all facets of their onsite sewage treatment program.

This Plan supports enabling legislation for onsite sewage system management districts by local boards of health by local operation monitoring.

Administration of On-site Sewage Regulations

- All programs for improving on-site sewage treatment must be adequately financed. Investigate implementation of a fee schedule and charges to make the regulatory system for administering home sewage and package plant programs self-financing.
- Establish stream and septic system monitoring programs to identify failed systems. Areas designated as CSAs should have priority for:
  - Stream monitoring and sanitary surveys.
  - Financial assistance to homeowners for upgrading systems using State Water Pollution Control Revolving Loan Fund programs or other grant/loan programs.
  - Cost share funds through the U.S. EPA §319 non-point source program.

Public Information and Education

- Develop and conduct information and education programs and materials with boards of health through the TMACOG Water Quality Council, its subcommittees, watershed stewardship organizations, and the Northwest Ohio Sewage Consortium. Educational programs should be geared to take advantage of available funding through grant programs, such as the Ohio Environmental Education Fund, the Lake Erie Protection Fund, and the Coastal Zone Management Assistance program.
- Adopt policies requiring site inspections prior to sale or development of a parcel of property.

X. Critical Sewage Areas

County/Local boards of health identify CSAs. These are areas with concentrations of failed or failing onsite sewage systems, based on sampling results, complaints received by the health department; or areas with suspected failures based on health department observations and best professional judgment. System failures result in known or suspected cases of:

- Surface water contamination, and/or
- Ground water contamination, and/or
- Public health nuisances

County/local health departments identify CSAs as places where existing system upgrades/replacements often will not solve the problem or are not an optimal solution because:

- There is a significant concentration of onsite systems that are known or suspected to have failed.
- Most of the systems are on small lots that do not have room for replacement leaching fields.
- Soil conditions for leaching fields are poor due to shallow bedrock, tight silt/clay soils, and/or seasonally high groundwater.

CSAs are:

- Priority areas for Ohio EPA, Michigan EGLE, and health departments to conduct sanitary surveys.
- Priority areas for inspection and increased maintenance of onsite systems until a central public sanitary sewerage system is in place.
- Priority areas for public sanitary sewers or innovative community STSs to replace concentrations of individual systems. For CSAs where a public sanitary sewerage system is the best alternative, the priority order for construction may be affected by the availability of financial assistance.
- Priority areas for financial assistance to homeowners for installing public sanitary sewers.

CSAs are listed in Table 6-11 by county without prioritization. The code numbers for each CSA correspond to the regional map labels shown below in Figure 6-1.

Table 6 - 11: Critical Sewage Areas

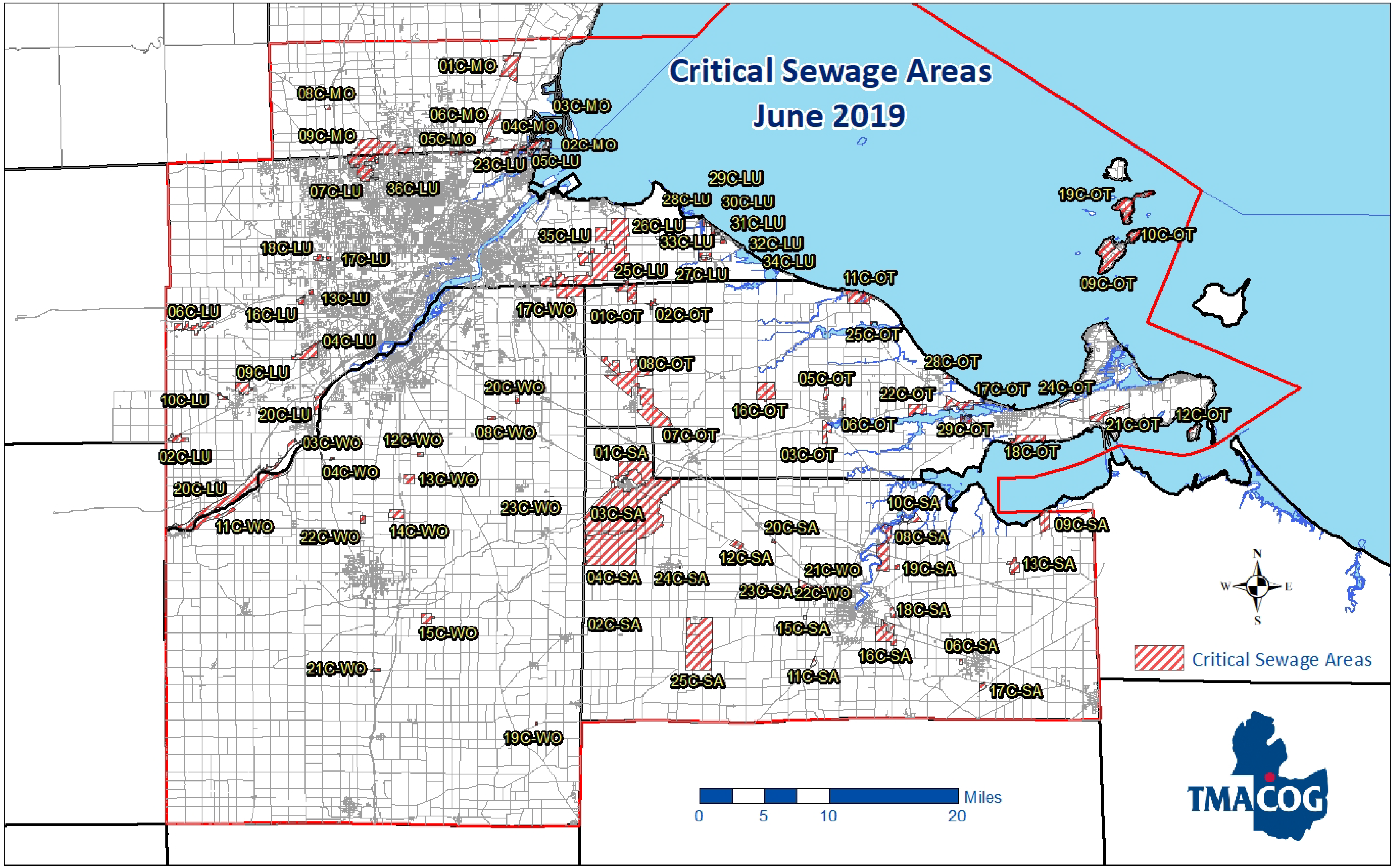
Name	Number	Description	Priority
Lucas County			
Neapolis (Prov.)	02C-LU	>150 homes, businesses, mobile home park	3
Monclova/Coder Road (Mon)	04C-LU	>55 homes, businesses	
Point Place/Washington Twp. (Tol)	05C-LU	3 homes	
Shoreland Avenue (Wash)	05C-LU	>30 homes	4
Swan Creek Headwaters: Airport Hwy (Swan)	06C-LU	>30 homes, businesses	
Alexis/Whiteford/Flanders Road (Sylt)	07C-LU	>300 homes	2
Springbrook/Davis/Winslow Road (Wat)	09C-LU	>60 homes	
SR 64 NW of Whitehouse (Wat)	10C-LU	>25 homes	
Rancamp/Annin Road (Spr)	13C-LU	>60 homes	
West State Line Road (Tol)	15C-LU	>50 homes, business	
East State Line/Detroit Avenue (Tol)	15C-LU	>10 homes, business	
Longworth/Sudbury Road (Spr)	16C-LU	>70 homes	
East Hancock (Spr)	17C-LU	>50 homes	
West Hancock (Spr)	18C-LU	>60 homes	
River Road South (Prov/Wat)	20C-LU	>60 homes	5
North Toledo (Tol)	23C-LU	Businesses	
Curtice (Jer)	25C-LU	>40 homes	1
Decant Road (Jer)	26C-LU	>20 homes	
Donovan/Yoder/Standart Road (Jer)	27C-LU	20 homes	
Coolie Road (Jer)	28C-LU	5 homes, mobile homes	

Name	Number	Description	Priority
Beach Park Drive (Jer)	29C-LU	5 homes	
Pavilion/Beach View/Temple Road (Jer)	30C-LU	>25 homes	
Northway/Lakeway/Corduroy Road (Jer)	31C-LU	10 homes	
North Street (Jer)	32C-LU	4 homes	
Rachel Road (Jer)	33C-LU	8 homes	
Toulon/Lafontaine Road (Jer)	34C-LU	20 homes	
Wolf Creek Watershed (Ore/Jer)	35C-LU	Several hundred homes	
Secor Road (Tol)	36C-LU	10 homes	
Monroe County			
Erie	01C-MO	>200 homes, apartment, businesses	
Lost Peninsula	02C-MO	>50 homes, marina	
McLeary's Point	03C-MO	>40 homes	
Morin Point	04C-MO	>100 homes	
State Road	05C-MO	10 homes, businesses	
South Dixie	06C-MO	>150 homes, businesses	
Whiteford Schools	08C-MO	Schools	
Whiteford / Bedford State Line	09C-MO	>200 homes, businesses, airport	
Ottawa County			
Curtice	01C-OT	>200 homes, apartments, businesses	1
Williston	02C-OT	>140 homes, businesses	1
SR 19 S of Oak Harbor	03C-OT	10 homes, businesses	
SR 19 N of Oak Harbor to Salem-Carroll Road	05C-OT	>20 homes	
Behlman	06C-OT	28 homes	
Clay Twp Near Genoa	07C-OT	>60 homes, mobile home park, businesses	
Clay Twp Near Genoa	08C-OT	>150 homes, businesses	
South Bass Island	09C-OT	>100 homes	4
South Bass Island	10C-OT	>100 homes	4
Locust Point	11C-OT	>200 homes, 2 marinas	
Johnson's Island	12C-OT	>80 homes	
Rocky Ridge	16C-OT	>150 homes, businesses	5
Erie Twp: SR 163 and Lakeshore Drive	17C-OT	>70 homes, >25 mobile	

Name	Number	Description	Priority
		homes, businesses	
Portage Twp. south shore, sections 7, 8, and 9	18C-OT	>150 homes	
Middle Bass Island	19C-OT	Hundreds of homes, dozens of businesses	
Port Clinton Eastern Road	21C-OT	>75 homes, school, businesses	
Lacarne	22C-OT	>80 homes, businesses, >60 mobile homes	
East Harbor Road	24C-OT	>15 homes, businesses	
Toussaint River Association	25C-OT	>50 homes, businesses	
Willow Beach	28C-OT	>60 homes	2
Nugent’s Canal	29C-OT	>230 homes, businesses	3
Sandusky County			
Toussaint Cr	01C-SA	Stone quarry	
Portage below S. Br	02C-SA	6 homes	
Portage below N. Br	03C-SA	>80 homes, stone quarry	
Sugar Cr	04C-SA	>80 homes	
Woodland Hts.	06C-SA	>20 homes	
Muncie Hollow	08C-SA	>50 homes	3
White's Landing	09C-SA	>60 homes	
Wightman's Grove	10C-SA	>40 homes, marina	1
Rambo Rd	11C-SA	>30 homes	
Hessville	12C-SA	>30 homes, businesses	5
Vickery	13C-SA	>60 homes, businesses	
Hayes/53	15C-SA	1 home	
Timpe / Twp Line / Cole	16C-SA	>60 homes, businesses	
Green Cr Limerick Rd	17C-SA	>50 homes, business	
Country Club Estates	18C-SA	>10 homes, golf course	
Barkshire Hills	19C-SA	>40 homes	4
Wooded Acres Campgrounds	20C-SA	>50 mobile homes	
West State Street	21C-SA	5 homes, businesses	
Christina Drive	22C-SA	>10 homes	
Four Mile House Road	23C-SA	>40 homes, businesses	
Rodriguez Street	24C-SA	15 homes	2
Millersville	25C-SA	>30 homes, stone quarry	

Name	Number	Description	Priority
Wood County			
SR 64 N of King	03C-WO	15 homes	
King Road / RR	04C-WO	>10 homes, business	
East Five Point Road	08C-WO	>10 homes	
Otsego along river	11C-WO	>60 homes, 20 mobile homes	3
Dowling	12C-WO	>25 homes, businesses	
Dunbridge	13C-WO	>60 homes, apartments, businesses	2
Sugar Ridge	14C-WO	>60 homes, 3 businesses	1
Kramer/Huffman	15C-WO	>30 homes	
Curtice/Bradner	17C-WO	>75 homes	4
Hatton	19C-WO	>10 homes	
Johnson's Subdivision	20C-WO	>35 homes	
Mermill	21C-WO	>20 homes, business	
Maurer's MHP	22C-WO	>100 mobile homes	
J&T MHP	23C-WO	2 homes, >10 mobile homes	

Note: Data are based on current available data as of April 2019. Monroe includes Erie, Bedford, and Whiteford Townships.



Critical Sewage Areas
June 2019
01C-MO
08C-MO
03C-MO
06C-MO
04C-MO
09C-MO
05C-MO
02C-MO
23C-LU
05C-LU
07C-LU
36C-LU
29C-LU
28C-LU
30C-LU
31C-LU
26C-LU
35C-LU
33C-LU
32C-LU
34C-LU
18C-LU
17C-LU
25C-LU
27C-LU
19C-OT
10C-OT
09C-OT
11C-OT
13C-LU
06C-LU
16C-LU
17C-WO
01C-OT
02C-OT
25C-OT
04C-LU
08C-OT
28C-OT
09C-LU
20C-WO
05C-OT
17C-OT
24C-OT
22C-OT
10C-LU
16C-OT
12C-OT
20C-LU
06C-OT
29C-OT
21C-OT
03C-WO
12C-WO
08C-WO
07C-OT
02C-LU
01C-SA
03C-OT
18C-OT
04C-WO
13C-WO
20C-LU
10C-SA
23C-WO
03C-SA
20C-SA
09C-SA
11C-WO
22C-WO
14C-WO
08C-SA
12C-SA
21C-WO
19C-SA
13C-SA
04C-SA
24C-SA
23C-SA
22C-WO
18C-SA
02C-SA
15C-SA
15C-WO
16C-SA
06C-SA
21C-WO
25C-SA
11C-SA
17C-SA
19C-WO
Critical Sewage Areas
Miles
0
5
10
20
N
W
E
S
TMACOG

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Chapter 7: Agriculture, Drainage, and Habitat

I. Introduction

Land area in the Toledo Metropolitan Area Council of Governments (TMACOG) region is comprised mainly (80%) of agriculture and other rural uses (Figure 7-1), with the most common row crops being corn, soybean, and wheat. Agriculture is a vital component to the region's economy and provides a sustainable source of food. In addition, farming is a culture and long-standing tradition for many families in northwest Ohio and southwest Michigan. As described in **Chapter 2**, most of the region was once a lake bottom and is part of the Huron-Erie Lake Plain ecoregion. This area covers a portion of the former Great Black Swamp, a giant wetland, and consists of silt and clays soils with poor natural drainage that frequently floods after precipitation events. However, many soils in the region are highly productive and rate as prime agricultural land after being drained. Subsurface tile drainage systems allow groundwater to drain a field to control the water level and are very common systems in the region and throughout the Midwest.

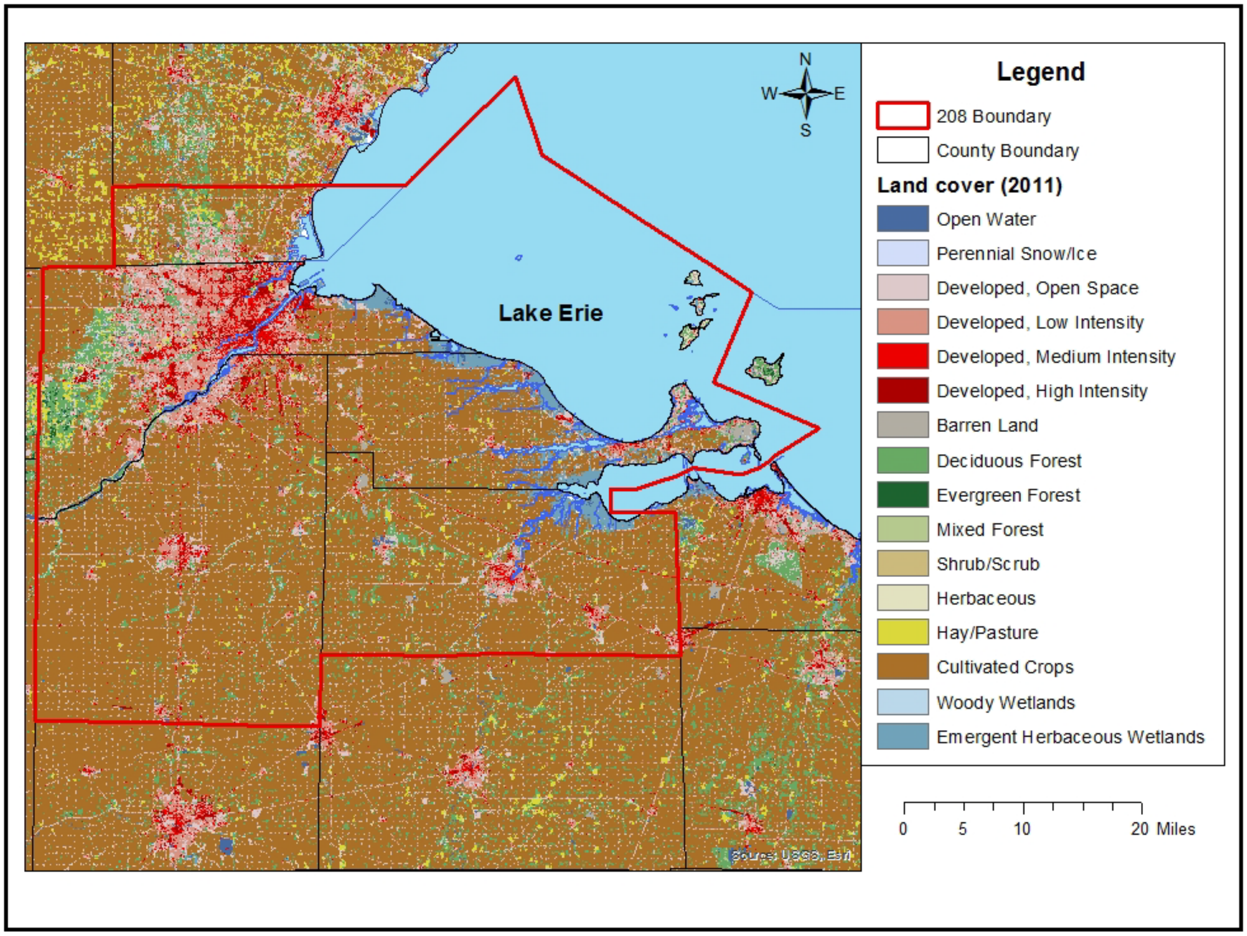

Figure 7 - 1: Land Use Coverage Within the 208 Plan Area
(Source: Land use data from Esri ArcGIS Online: USA National Land Cover Database, 2011)

Application of fertilizers to agricultural fields is needed to enhance the quality of soil to meet the nutrient demand of crops, and thereby maximize yield. Nitrogen, phosphorus, and potassium are the three major nutrients delivered as fertilizer, and the application rate for each nutrient varies based on the demand by the crop. For example, corn, soybean, and wheat remove greater amounts of nitrogen from the soil than phosphorus and potassium, but corn removes more phosphorus than soybean (Silva, 2017). Regardless of whether fertilizer is applied at the correct rate, there is potential for the nutrients to be transported off the farm field to adjacent drainage ditches by surface runoff or subsurface drainage during and after precipitation events.

Agriculture in the TMACOG region may potentially impact water quality based on two factors: (1) conversion of wetland to farm land and (2) water pollution from nutrients, sediments, and pesticides. The act of draining soils for productive agriculture alters the natural services provided by wetlands to improve water quality, such as filtration, flood control, nutrient cycling, and shoreline and storm protection. Draining wetlands also adversely impacts critical habitat for flora and fauna. Water pollution from agriculture is commonly known as non-point source (NPS) pollution, which is correlated to the amount of precipitation (Smith et al., 2015). Surface runoff may include soil, nutrients, and pesticides that flow overland into drainage ditches; subsurface drainage may include dissolved forms of the nutrients and pesticides. In addition to row crops, agricultural livestock such as confined animal feeding operations (CAFOs) are another potential source of pollution to surface water and groundwater.

At the present, we are facing a great challenge to maintain agricultural production while protecting the environment and critical ecosystem services. To meets these demands, an approach will be needed that addresses conservation stewardship, habitat protection, and innovative technologies.

This chapter complements **Chapter 2** with the purpose to recommend agricultural practices and policies, and to identify agency roles that support agriculture production and achieve goals of the Clean Water Act (CWA). Specific outcomes include:

1. Designation of management agencies with responsibilities to implement agricultural conservation practices and best management practices (BMPs).
2. Identification and prioritization of areas (including watersheds) for habitat protection and restoration, and where agricultural nonpoint pollutant load reductions are needed.

Details for BMPs identified to address priority areas are outlined in plans that have been approved by the United States Environmental Protection Agency (U.S. EPA) and Ohio EPA, which include Watershed Action Plans and Nine-Element Nonpoint Source Implementation Strategies (9-Element NPS-IS) (http://epa.ohio.gov/dsw/nps/index.aspx).

II. Lake Erie Studies

Collective results from several past studies and ongoing research programs guide our understanding of water quality in Lake Erie and assist in setting policies and goals.

Pollution from Land Use Activities (PLUARG)

Article VI of the Great Lakes Water Quality Agreement (GLWQA) signed in 1972, requested the International Joint Commission (IJC) to report on pollution of the boundary waters of the Great Lakes system from agricultural, forestry and other land use activities. The IJC established the International Reference Group on Great Lakes Pollution from Land Use Activities (PLUARG) to plan and implement the request (PLUARG, 1978).

Eutrophication, due to elevated nutrient inputs, particularly in the lower lakes (Erie and Ontario), and the increasing contamination of these water bodies by toxic substances, were identified as the major pollution problems in the Great Lakes basin. PLUARG concluded that the eutrophic condition of Lake Erie could not be related entirely to identifiable point sources, including municipal sewage treatment plants and industrial effluents. Major findings by PLUARG included:

1. The Great Lakes are being polluted from land drainage sources by phosphorus, sediments, some industrial organic compounds, previously used pesticides, and potentially some heavy metals.
2. The lakes most affected by phosphorus and toxic substances are Erie and Ontario.
3. Intensive agriculture is the major diffuse source contributor of phosphorus.
4. Erosion from crop production on fine textured soils and from disturbed soil in urbanizing areas were the main sources of sediment.
5. The most important land-related factors affecting the magnitude of pollution from land use activities were soil type, land use intensity, and materials (i.e. fertilizers) usage.

PLUARG issued several recommendations for agricultural nonpoint sources. Selected recommendations specific to Lake Erie are shown below.

- Development and implementation of management plans.
- Control of phosphorus – reduce phosphorus loads through implementation of point and non-point programs.
- Control of sediment – reduce the movement of fine-grained sediment from land surfaces.
- Agricultural land use – assist farmers to develop and implement water quality plans.
- Urban land use – control urban stormwater runoff.
- Wetlands and farmlands – preserve wetlands.

Lake Erie Wastewater Management Study

The Lake Erie Wastewater Management Study (LEWMS) was conducted by U.S. Army Corps of Engineers (USACE) in 1979 to i) identify and quantify phosphorus and sediment sources, ii) develop a management strategy to control the sources, and iii) assess the strategy's economic impact. The study evaluated the water quality conditions of Lake Erie to develop a recommended wastewater management program to restore and rehabilitate Lake Erie. The study identified diffuse (i.e. non-point) sources of phosphorus as a major problem that must be controlled to restore Lake Erie (USACE, 1979). Land management options to reduce sediment export from agricultural fields were analyzed and evaluated. Major conclusions from the study include:

- The bulk of the phosphorus from non-point and point sources reached Lake Erie in association with suspended sediment transported during storm events.

- The biological availability of sediment-bound phosphorus varied considerably with flow and between river basins.
- Reducing gross erosion would reduce phosphorus loads to Lake Erie.
- Non-point source phosphorus is derived principally from agricultural land use, particularly crop production.
- Adoption of conservation tillage and no-till practices appeared to be an economically feasible method of reducing potential erosion in the Lake Erie basin.
- A maximum rural non-point source phosphorus reduction of 4,100 to 5,100 metric tons per year would result if the maximum reduced tillage scenario was achieved and erosion reduction was 90% effective in reducing phosphorus.
- Tillage practices other than conservation tillage and no-till were shown to be unable to achieve significant erosion reductions.
- In addition to conservation tillage and no-till practices, other controls of sediments and phosphorus must be appropriately applied. These controls include animal waste management, gully erosion control via waterways and structures, and farm conservation plans.
- Long-term water quality monitoring is required to measure reductions in sediment and phosphorus transport resulting from non-point source management.
- Education and technical assistance programs are needed to accelerate the adoption of conservation tillage, no-till, and other cost effective BMPs.
- The environmental benefits of erosion control extend well beyond a reduction in phosphorus.

Overall, the Lake Erie basin-wide benefits resulting from sediment reductions included: reduced sedimentation and reduced dredging costs in Lake Erie harbors; lower water treatment costs for sediment removal from domestic water supplies; less movement and transport of other sediment attached pollutants such as insecticides and herbicides; reduced in-stream sedimentation which benefits the fishery resources. In addition, BMPs that help prevent sedimentation also improve aquatic habitat, such as riparian buffer zones.

National Center for Water Quality Research - Heidelberg University, Ohio

The National Center for Water Quality Research (NCWQR) was originally started as the River Laboratory by Dr. David Baker in 1969. The laboratory focuses on nutrient and sediment loadings from several Lake Erie tributaries, which requires sampling stations to collect frequent data on stream flow and pollutant concentrations. NCWQR partners with the U.S. Geological Survey (USGS) who provides the stream flow measurements, and laboratory staff collect and analyze the water samples. The tributary loading program is necessary to compare the amounts of pollutants derived from diffuse nonpoint sources, such as agricultural and urban storm runoff, with contributions from point sources, such as sewage treatment plants. NCWQR maintains three monitoring sites in the TMACOG region: Maumee River in Waterville (data available from 1975); Portage River in Woodville (data available from 2010); Sandusky River at Ballville near Fremont (data available from 1974). The laboratory has been successful in maintaining continuous funding for the tributary loading program and has numerous publications in peer reviewed scientific journals (https://ncwqr.org/).

Ohio Lake Erie Phosphorus Task Force I and II

The re-emergence of nuisance algal blooms in the mid-1990s and massive blooms in 2003 and 2006 led the Ohio EPA and NCWQR to convene the Ohio Lake Erie Phosphorus Task Force in 2007. The purpose of the Task Force was to review and evaluate the increasing dissolved reactive phosphorus (DRP) loading trends and the connection to the deteriorating conditions in Lake Erie. The goal of the Task Force was to identify and evaluate potential point and nonpoint sources and related activities that might be contributing to the increasing trend in the DRP load (Ohio EPA, 2010). The Task Force included personnel from federal, state and local agencies, stakeholder groups, educational institutions, and completed a broad-based review of studies throughout the region to gather data and information. Key observations made by the Task Force included:

- Point source and lawn care products are not major contributors to the increase in algal blooms.
- Zebra and quagga mussels influence the internal cycling of phosphorus within Lake Erie, but their influence is expected to be short-lived.
- There is a lack of evidence that differentiates the relative contributions of commercial fertilizers and the land application of manure.
- Agricultural phosphorus applications have decreased, but DRP concentrations have increased. There have been changes in agriculture practices on the methods, amount, form, placement, and timing of nutrient applications. Management practices that focus on the application of nutrients will have the greatest potential for reducing phosphorus levels in Lake Erie.
- Improved and more frequent soil testing is recommended to identify the correct rate of phosphorus application needed for crop production. Along with testing, precision nutrient management technology can control nutrient applications at the optimum rate.
- There is no single agricultural practice that will result in lowering nutrient runoff. A suite of BMPs is needed that address methods of application, amount, form, and placement, and practices that inhibit runoff delivery to local streams.
- Changing seasonal patterns of rainfall and runoff have contributed to increased runoff of DRP to Lake Erie. Stream corridors can provide assimilative capacity for the uptake of in-stream nutrients in stream runoff, but benefits are primarily localized to stream condition. Addressing upland measures such as on-the-field, will yield the most beneficial results for phosphorus control.
- DRP concentrations and loads from the Maumee and Sandusky rivers are much higher than other Ohio Lake Erie rivers, making them a priority.

In 2012, Ohio EPA, in partnership with Ohio Lake Erie Commission (OLEC), Ohio Department of Agriculture (ODA), and Ohio Department of Natural Resources (ODNR) reconvened the Ohio Lake Erie Phosphorus Task Force as a Phase II effort. A wide range of participants including members of the original Ohio Lake Erie Task Force, agri-business representatives, and crop consultants came together to build upon the findings of the 2010 Phosphorus Task Force report. The purpose of Phase II was to i) develop reduction targets for total phosphorus and DRP that can be used to track future progress, and ii) develop policy and management recommendations based on new and emerging data and information (ODA et al., 2013). Recommendations made by Phase II include:

- A robust monitoring program to measure progress toward loading and concentration targets and harmful algal bloom (HAB) reduction, and to allow annual evaluation and modification of the targets in the future.
- A 37% reduction in the average spring total phosphorus load of 1,275 metric tons for 2007-12, or a target of 800 metric tons. A 39% reduction from the average annual total phosphorus load of 2,630 metric tons for 2007-12, or a target of 1,600 metric tons.
- A 41% reduction in the average spring DRP load of 256 metric tons for 2007-12, or a target of 150 metric tons.
- Applying loading reduction targets to all western basin tributaries.
- Efforts should be made to improve the regional soil health. Agricultural practices should attempt to increase organic matter, reduce compaction, and minimize pesticide use.
- Drainage management structures and other edge-of-field runoff reduction and storage practices need to be a part of the overall management practices across the northwest Ohio landscape while acknowledging that they may not be well suited for some agricultural fields.

Ohio EPA Mass Balance Study for Ohio's Major Rivers

Ohio EPA initiated their study to serve as a baseline and aid in tracking progress of the goals established by the 2012 GLWQA and Gulf of Mexico Hypoxia Task Force 2008 Action Plan. Ohio EPA is required by Ohio law (Ohio Revised Code 6111.03) to complete the nutrient accounting for the Maumee, Portage, Sandusky, Cuyahoga, Great Miami, Scioto, and Muskingum watersheds on a two-year basis and coinciding with the release of the Ohio EPA's Integrated Water Quality Monitoring and Assessment Report. The study computed nutrient loadings for these seven major watersheds that comprise 63% of Ohio's land area for the water years 2013 and 2014 (Ohio EPA, 2016a). Major findings include:

- The Maumee watershed generated the highest annual total phosphorus load for both water years (2013 and 2014) – an average of 2,200 metric tons per annum.
- Non-point sources were the highest contributors to the phosphorus load in the Sandusky (93% of the total load), Maumee (88%), and Portage (85%) watersheds.
- National Pollutant Discharge Elimination System (NPDES) permitted facilities accounted for 4-11% for total phosphorus and 2-10% for total nitrogen in the Maumee, Portage, and Sandusky watersheds.
- Home sewage treatment systems (HSTS) accounted for 3-8% for total phosphorus and 1-2% for total nitrogen in the Maumee, Portage, and Sandusky watersheds.

Ohio's Domestic Action Plan

The Ohio Domestic Action Plan (DAP) was prepared in accordance with the GLWQA by OLEC, Ohio EPA, ODA, ODNR, and Ohio Department of Health (ODH) (OLEC et al., 2017). The Ohio DAP was in draft form at the time this chapter was updated in early 2018.

The U.S. and Canada renegotiated the GLWQA in 2012 to establish Annexes focused on critical issues. Specifically addressing HABs is Annex 4, which focuses on nutrients and problems associated with excessive phosphorus loading. To control algal species and cyanobacterial biomass, the GLWQA recommends a 40 percent reduction in spring total P and DRP for several rivers in the U.S. and Canada, including the Maumee, Portage, and Sandusky (U.S. EPA, 2018).

The Ohio DAP was developed to advance efforts toward the proposed 40% nutrient reduction target put forth by the GLWQA of 2012 (OLEC et al., 2017). The Ohio DAP outlines a list of action items for each of the state agencies based on the following types of actions (Kosek-Sills, 2018).

- Agricultural Land Management
  - Agricultural BMPs
  - Guidance actions
  - Education and outreach actions
- Community-Based Nutrient Reduction
  - Review and revise NPDES permits
  - Nutrient specific combined sewer overflow study
  - Continue infrastructure funding
  - Develop watershed implementation plans
  - Evaluate new technologies
  - HSTS operations and maintenance
- Restoration and Support of Ecosystem Services
  - Identify potential areas suitable for restoration
  - Continue restoration funding
- Monitoring, Tracking, Research, and Support
  - Continue to sample water quality at fixed shoreline and nearshore stations
  - Establish monitoring network as a starting point for state prioritized funding

III. Background and History of Non-Point Source Pollution in Lake Erie

Phase 1: Blue-Green Algae Blooms

Excessive nutrient loading into Lake Erie in the 1960s and 1970s resulted in large blue-green algae blooms in the western basin and dead zones (areas of hypoxia/anoxia or no dissolved oxygen) in the western and central basins. As stated above, the LEWMS identified excessive phosphorus loading as the principal cause of accelerated eutrophication and anoxic conditions in Lake Erie (USACE, 1979). Non-point sources accounted for nearly 50% of the total phosphorus load to Lake Erie, with contributions from non-point sources increasing in agricultural dominated watersheds. For example, non-point sources accounted for 80% of the total phosphorus in the Maumee River watershed.

In 1975, the total phosphorus load to Lake Erie was approximately 20,000 metric tons per year, and in 1978 the GLWA set a target of 11,000 metric tons per year. The required reduction was divided between the U.S. and Canada, and within the U.S. between nonpoint and point sources; nonpoint source reduction targets were ultimately set for individual Ohio Lake Erie counties. LEWMS predicted that reaching this target would reduce the area of anoxia in the central basin by 90 percent within a few years.

Phase 2: Success of Sewage Treatment Improvements and Conservation Tillage

To address phosphorus loading from point sources, U.S. EPA created the NPDES in Section 402 of the CWA in 1972. The NPDES permit program controls water pollution by regulating discharge of point source pollutants into waters of the U.S. The CWA established a total phosphorus concentration limit of 1.0 milligram per liter (mg/L) in the effluent for wastewater treatment plants with flows greater than 1.0 million gallons per day (MGD). Improvements to the water quality in Lake Erie were observed within 10 years after implementation of the NPDES program. This is demonstrated by the LEWMS, which noted the total phosphorus loading from point sources was 11,900 metric tons per year in 1970 and reduced to 4,500 metric tons per year by 1980.

Conservation tillage or reduced tillage was identified by the LEWMS as a BMP to reduce losses of phosphorus and soil from farm fields. The practice of conservation tillage expanded rapidly in the Lake Erie basin, starting with little adoption in the early 1970s and increased to 22% on the basin's cropland in 1981; no tillage was used on 4% of the cropland (Yaksich, 1982). Annex 3 of the 1978 GLWQA, prepared by the U.S. EPA in 1981 reaffirmed the target total phosphorus load of 11,000 metric tons per year. The re-evaluation indicated that if all municipal wastewater treatment plants with flow greater than 1.0 MGD achieved the phosphorus concentration of 1.0 mg/L in effluents, loadings in Lake Erie would be reduced to 13,000 metric tons per year. Therefore, an additional 2,000 metric tons per year would be required to achieve the target goal of 11,000 metric tons per year. The LEWMS indicated that a conservation tillage program could ultimately achieve the 2,000 metric tons per year reduction in total phosphorus at a benefit/cost ratio of 10:1 (Yaksich, 1982).

Agricultural agencies promote conservation tillage through technical assistance, demonstration projects, education, and cost-share incentives. In the 1980s, Wood and Ottawa County Soil and Water Conservation Districts (SWCDs) promoted conservation tillage by purchasing equipment with grant funding and then renting it to farmers. This approach allowed farmers to try no-till farming without having to spend money on a no-till drill. These types of cost-share programs, notably through the U.S.

Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS): at the time known as the Soil Conservation Service, ODA, Ohio EPA, and ODNR supported use of conservation tillage. By the late 1980s and into the 1990s, conservation tillage became widely applied.

Improvements to water quality in Lake Erie were achieved through the combination of enforcing regulations for municipal wastewater treatment plants effluent and application of conservation tillage. During the 1980s and 1990s phosphorus loads declined and the impacts by algal blooms were alleviated (Figure 7-2). It's worth noting that between 1983-2006, the phosphorus target load was met 19 times out of the 24 years. Point source loadings have declined to around 2,000 metric tons per year, which is less than half the load in 1980, and less than one-fifth of the 1970 load. Nonpoint source loads varied widely, depending on the weather and storm event patterns (Ohio EPA, 2010). Lake Erie seemed to be well on its way to recovery.

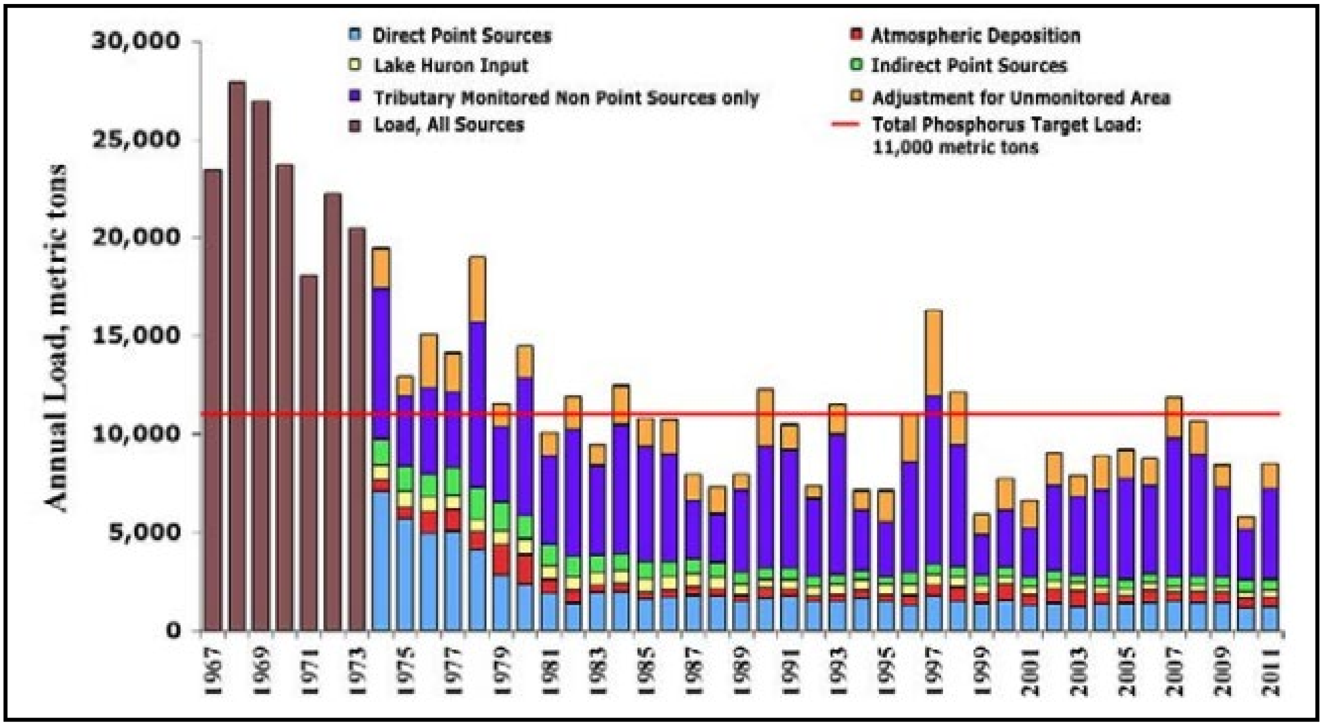

Figure 7 - 2: Lake Erie Annual Loads of Total Phosphorus
(Source: Scavia et al., 2014)

Phase 3: The invasion of the Zebra and Quagga Mussels

Zebra and then quagga mussels quickly spread throughout the western Lake Erie basin (WLEB) and its tributaries in the early 1990s. The mussels immediately became a nuisance to public water supply systems, as they grew in thick colonies on water intakes and interfered with the ability to provide drinking water. Water treatment costs increased because of the need to kill the mussels and remove their shells during the treatment process. Despite the mussels making the lake water clearer though their filter feeding, it was unknown at the time that the mussels were changing the pathways of phosphorus in the lake ecosystem. Lake total phosphorous levels continued to decline during the explosive spread of the mussels, reaching the lowest levels in 1995 (Scavia et al., 2014).

Phase 4: Re-emergence of Harmful Algal Blooms

DRP loads in the Maumee and Sandusky Rivers decreased from the 1970s to the mid-1990s, but have been on the rise since 1995 (see discussion below on tributary loads). Total phosphorus is comprised of both particulate phosphorus (phosphorus attached to soil particles), and dissolved phosphorus (phosphorus dissolved in water). Whereas particulate phosphorus is approximately 25% bioavailable (usable by plants and algae), DRP is 100% bioavailable (Johnson, 2017).

Elevated levels of cyanobacteria in the WLEB began to reappear in the late 1990s and have grown rapidly since 2002 with the worst blooms occurring in 2011 and 2015 (Figure 7-3). In 2014, an algal bloom dominated by the species *Microcystis aeruginosa* produced the toxin microcystin (a liver toxin) at levels exceeding the World Health Organization (WHO) drinking water standard of 1.0 microgram per liter (µg/L) or part per billion (ppb). The elevated level of microcystin resulted in the City of Toledo to post a "do no drink" advisory to approximately 500,000 residents of the region for parts of three days (Toledo Blade, 2018).

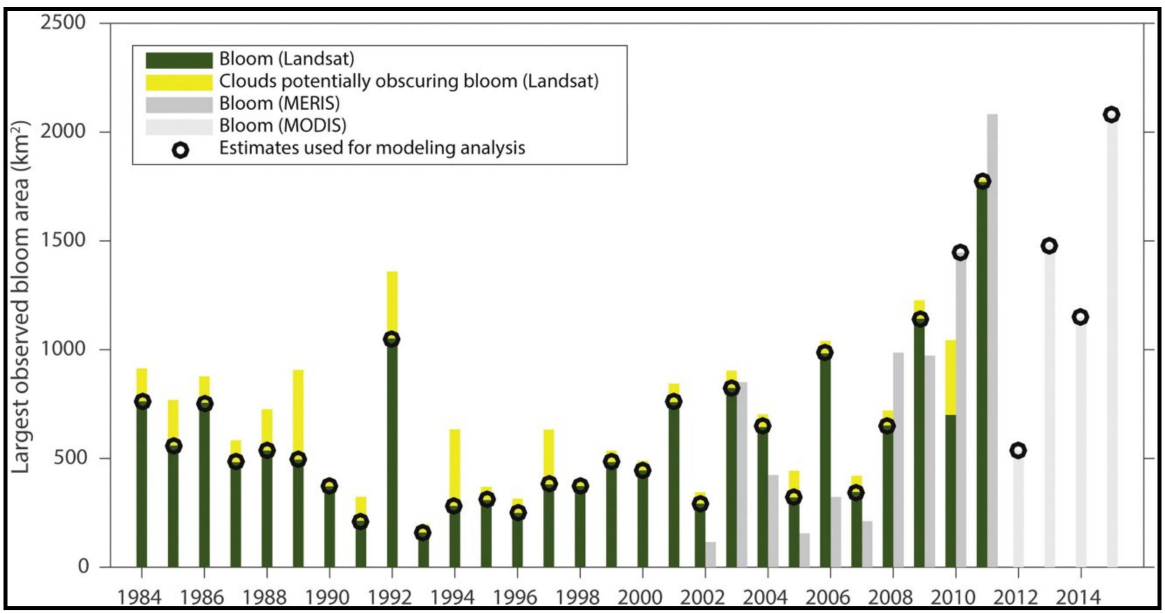

Figure 7 - 3: Historical Record of Maximum Summertime Algal Bloom Extents
(Source: Ho and Michalak, 2017)

Despite regional efforts that successfully reduced suspended solids and particulate phosphorus loads, a consensus was made by the regional stakeholders that phosphorus control measures may be needed that differ from controls used previously. As noted above, the GLWQA of 2012 recommends a 40 percent reduction in spring total phosphorus and DRP for several rivers in the U.S. and Canada, including the Maumee, Portage, and Sandusky (U.S. EPA, 2018). Ohio's DAP outlines actions that several of the state agencies will implement to advance efforts toward the proposed 40% nutrient reduction target.

Researchers recently identified nitrogen as a potential growth limiting nutrient of harmful algal blooms (Chaffin et al., 2013) and a major factor in production of the toxins (Davis, 2017). These findings indicate that nitrogen is now a major component to addressing harmful algal blooms.

IV. Western Basin Tributary Nutrient Loads

The principal rivers of the region include the Maumee, Portage, and Sandusky and descriptions for each river are provided in **Chapter 2**. These three rivers share many common characteristics, including predominant agricultural land use, flat terrain with little elevation change, and fine-textured soils such as silts and clays. Available long-term data for the Maumee and Sandusky Rivers demonstrates similar annual trends in water quality parameters (Figures 7-4 and 7-5), while the short-term data for the Portage River supports different trends in discharge, total phosphorus, DRP, and particulate phosphorus (Figure 7-6).

Lake Erie: Phosphorus Load Overview

Broadly classified, nutrients enter Lake Erie from the Detroit River, Maumee River, and all other tributaries. While the Detroit River comprises 94% of the total flow into Lake Erie, the river's phosphorus load is less than the Maumee River (Table 7-1). It is important to note the total phosphorus levels in the Detroit River are approximately 25 times smaller than the Maumee River (0.014 mg/L versus 0.42 mg/L, respectively).

Table 7 - 1: Lake Erie Phosphorus Load Sources

Source	Lake Erie Basin Land Area (%)	Flow into Lake Erie (%)	Average Total Phosphorus Load (Metric tons / year)	Flow-weighted Phosphorus Level (milligrams / liter)
Detroit River	22.4	94	2,233 (41%)	0.014
Maumee River	42.6	4	2,568 (47%)	0.42
Other Tributaries	35.0	2	689 (12%)	0.27

Data from 2011-2013. (Source: U.S. EPA, 2015)

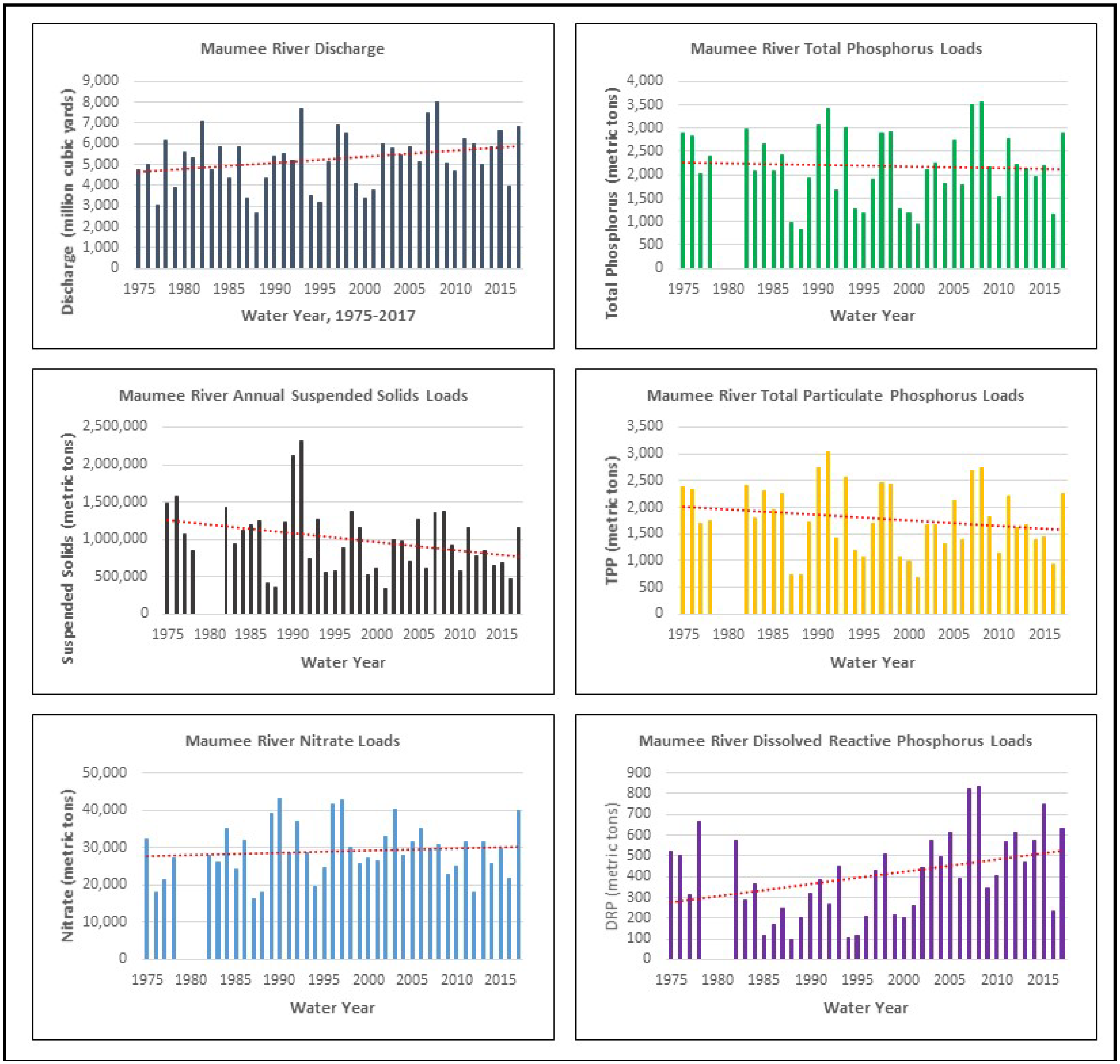

Figure 7 - 4: Maumee River Water Quality Data, 1975 to 2011

(Source: National Center for Water Quality Research, Heidelberg University, 2018)

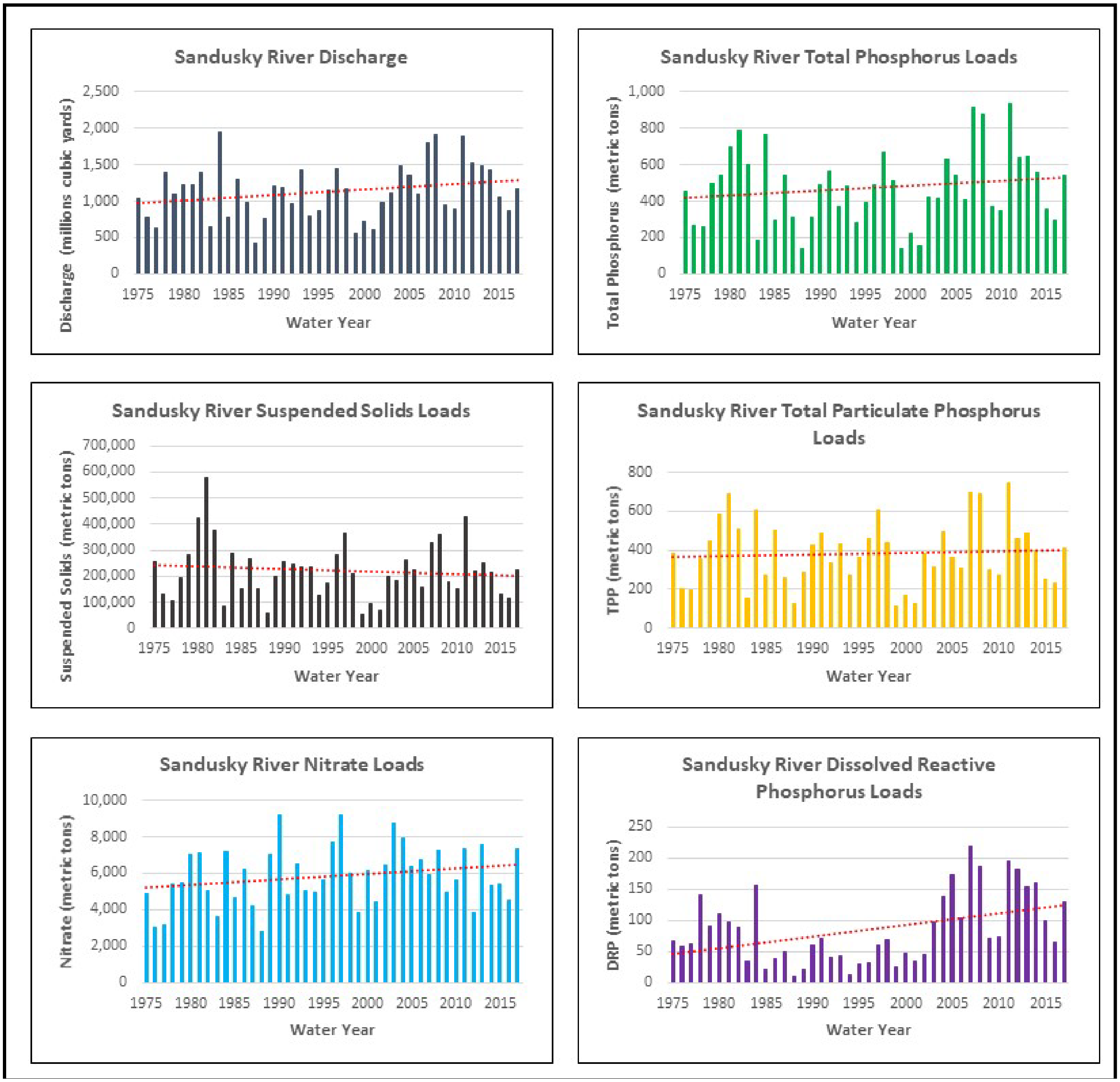

Figure 7 - 5: Sandusky River Water Quality Data, 1975 to 2011

(Source: National Center for Water Quality Research, Heidelberg University, 2018)

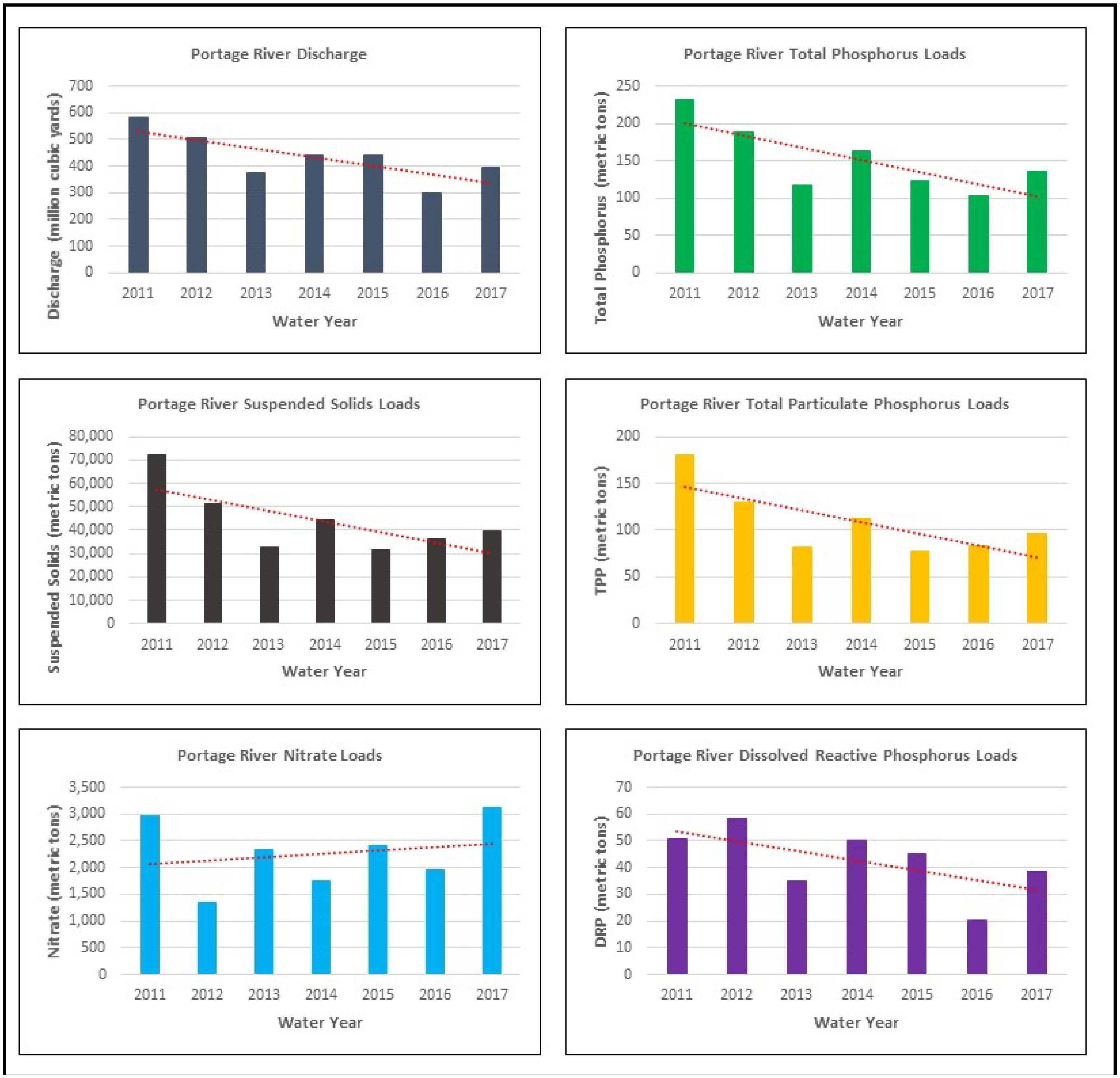

Figure 7 - 6: Portage River Water Quality Data, 2011 to 2017

(Source: National Center for Water Quality Research, Heidelberg University, 2018)

General Conclusions

- Although the Maumee River contributes only 4% of the flow into Lake Erie, the river contributes nearly half of the total phosphorus load to Lake Erie. This is because of the elevated levels of phosphorus compared to other tributaries.
- Long-term available data for the Maumee and Sandusky Rivers demonstrates similar annual trends in water quality parameters. This is not surprising, since both rivers share similar geography, soil types, and land use.

V. Western Lake Erie Basin Agricultural Best Management Practices

Achieving sustainable agricultural productivity while conserving soil and water is a national priority. Implementation of agricultural conservation practices or BMPs have made significant headway in reducing nutrient and sediment losses from agricultural fields; however, no single practice can meet the needs for each field or farm. The USDA-NRCS identified five major resource concerns that impact soil health and off-site water quality in the WLEB (USDA-NRCS, 2016a), including: sediment loss, soil organic carbon change, subsurface nitrogen loss, total phosphorus loss, and soluble phosphorus loss.

In 2012, the USDA-NRCS completed an assessment on the effects of conservation practice adoption on cultivated cropland in the WLEB (USDA-NRCS, 2012a). Major findings included:

- Ninety-nine percent (99%) of cropland acres are managed with at least one conservation practice.
- Thirty-five percent (35%) of cropland acres have conservation practices in place that adequately address all five resource concerns, and 59% of cropland acres have practices that adequately address at least four resource concerns.
- Ninety-six percent (96%) of cropland acres are adequately managed to prevent average annual sediment losses of more than two tons per acre.
- Seventy percent (70%) or more of nitrogen applied is removed by crop harvest on nearly 95% of cropland acres.
- Fifty-eight percent (58%) of cropland acres are managed with phosphorus application rates at or below crop removal rates.
- Forty-two percent (42%) of cropland acres are the source of 78% of total annual phosphorus losses and 80% of total sediment losses.
- Winter application rates were unchanged and remained low, with 13% of total phosphorus applied between November and February.
- More than 8.9 million gallons of diesel fuel consumption equivalents were saved from conservation tillage adoption, translating to a reduction of over 99,500 tons of CO_2 emissions.

USDS-NRCS compared the results from 2012 to their previous assessment made between 2003-06. Major environmental improvements included:

- Average sediment loss at the edge of the field decreased from 1.1 to 0.5 tons per acre per year, largely due to the increased adoption of edge-of-field trapping practices.

- Average phosphorus application rates declined, with average annual application rates decreasing by nearly 2.7 pounds per acre, declining from 21.5 to 18.7 pounds per acre (lbs/acre) per year. Crop removal rates remained constant.
- Average total phosphorus loss declined from 2.3 to 1.9 lbs/acre per year. The decrease was driven by a reduction in surface losses, which correlates with the reduction in sediment losses. Soluble phosphorus losses remained the same, at 1.3 lbs/acre annually delivered past the edge of the field.
- Average nitrogen losses to surface flows decreased from 7.1 to 4.6 lbs/acre per year, although nitrogen inputs and subsurface losses did not change significantly, nor did nitrogen removal by crops at harvest.

Types of Agricultural Conservation and Best Management Practices

Agricultural conservation and BMPs are techniques that address soil and water resources for a specific region or field. These practices may be categorized as on-field and off-field, with a few examples summarized below and in Table 7-2.

On-field practices include:

- Conservation tillage – any tillage or planting system that covers an area of soil surface with crop residue, after planting to reduce runoff and soil erosion.
- Cover crops – plants grown during the off-season when cash crops are not being produced to protect soil surface from raindrop impact, improve infiltration relative to bare soil, and trap eroded soil particles.
- Crop rotation – growing different crops in the same area in sequenced seasons. Crop rotation reduces soil erosion and increases soil fertility and crop yield.
- Nutrient management – manipulates the application of plant nutrients to reduce their loss via surface runoff and subsurface drainage and maximize crop production. In general, "4 R" principles of applying nutrients that use the right source applied, at the right rate, at the right time, and in the right place (https://4rcertified.org/).

Off-field practices include:

- Conservation buffers – strips or small areas of land in permanent vegetation that help reduce pollutants transported off fields from entering surface waters. Types of conservation buffers include: filter strips, grassed waterways, windbreaks, contour grass strips, and riparian buffers.
- Drainage control – structures used to modify the timing and amount of discharge from subsurface drainage systems. Drainage control reduces pollutant loads entering surface waters and increases crop yield.

- Stream restoration – the process of returning a stream as closely as possible to conditions and functions prior to a disturbance. Restoration promotes ecological diversity and natural filtration and utilization of nutrients.

Table 7 - 2: Agricultural Conservation and Best Management Practices

Practice	Resource Concerns Addressed				
	Sediment Loss	Soil Organic Carbon Change	Subsurface Nitrogen Loss	Total Phosphorus Loss	Soluble Phosphorus Loss
Conservation tillage	x	x	x	x	x
Cover crops	x	x	x	x	x
Crop rotation	x	x			
Nutrient management	x	x	x	x	x
Conservation buffers	x		x	x	x
Drainage control			x	x	x
Stream restoration	x		x	x	x

VI. Drainage

Soils of the region are fertile and support highly productive agricultural practices. However, this is only possible by using subsurface tile drains and/or extensive systems of drainage ditches that promote drainage from the fields. Ohio and Michigan have laws and regulations pertaining to how local agencies may provide adequate agricultural drainage.

Ohio Drainage Law

The Ohio Revised Code (http://codes.ohio.gov/orc) provides several mechanisms for constructing and maintaining drainage facilities.

- **Chapter 6131: Single County Ditches** invests County Commissioners with the authority to construct ditch improvements when petitioned by land owners of the affected drainage area.
- **Chapters 6133 and 6135** provide mechanisms for **Joint County Ditches** and **Interstate County Ditches**, respectively.
- **Chapter 6137: Ditch Maintenance Fund** establishes rules and procedures for levying and using property assessments.
- **Chapter 6151: Watercourses** establishes the authority of the County Commissioners to straighten watercourses.
- **Chapter 1515: Soil and Water Conservation Commission** establishes the authority of Boards of SWCD Supervisors to plan, construct, and maintain measures to control soil and water resources.

- **Chapter 6101: Conservancy Districts** establishes a mechanism for a district to undertake studies or projects addressing a wide variety of water resources or environmental issues, including flooding, stream channel or floodplain modification, water supply, or sanitary sewerage.
    - Conservation Districts of the region include:
        - Reno Beach-Howard Farms Conservancy District
        - Maumee Watershed Conservancy District
        - Wightman's Grove Conservancy District

Several other mechanisms are available that could be used for managing agricultural drainage, but are not currently used in the region:

- **Chapter 1710: Special Improvement Districts** may develop and adopt one or more written plans for public improvements or public services that benefit all or any part of the district.
- **Chapter 6105: Watershed Districts** may obtain the orderly development and the most beneficial use of the water resources.
- **Chapter 6115: Sanitary Districts** may be established for several purposes, including mosquito control and cleaning or improving stream channels or regulating the flow of streams for sanitary purposes.
- **Chapter 6117: County Sewer District** provides water, sewerage, and/or stormwater management services in unincorporated areas.
- **Chapter 6119: Regional Water and Sewer Districts** provide water supply, sewerage, and/or stormwater management services under a district plan, which may encompass more than one county.

Michigan Drainage Law

The Michigan Drain Code of 1956, Michigan Compiled Laws Section 280, is commonly referred to as “Act 40” (Michigan Legislature, 2018). Act 40 authorizes the county drain commissioner referred to as “commissioner”, drainage board, city, village, or township to construct ditch improvements when petitioned by land owners of the affected drainage area. The commissioner has jurisdiction over all drains within the county.

VII. Federal, State, and Local Agencies

Many federal, state, and local agencies have roles and responsibilities for agricultural practices, drainage, and habitat. The plan summarizes the roles fulfilled by such agencies (Tables 7-3, 7-4, and 7-5).

Table 7 - 3: Federal Agencies

Federal	
Agency	**Description**
U.S. Department of Agriculture (USDA)	Provides technical assistance and funding through two agencies: Farm Services Agency (FSA) • Conservation Reserve Program administration • Conservation Reserve Enhancement Program administration • Farmable wetlands program administration Natural Resources Conservation Service (NRCS) • Farm Bill program financial and technical assistance for conservation planning and practice implementation • Great Lake Restoration Initiative (GLRI) grants • Co-chair of the WLEB Partnership with the USACE • Maintain Ohio Field Office Technical Guide on conservation practices and standards
U.S. Environmental Protection Agency (U.S. EPA)	Responsible for regulations to implement the Clean Water Act. • Great Lakes Water Quality Agreement administration • Total Maximum Daily Load (TMDL) review • NPDES permit review • Nine-Element Watershed Plan oversight
US Fish & Wildlife Service (USFWS)	Conducts programs to protect fish and wildlife species, and their habitat; provides grant funding under some programs. • Endangered Species Program • International affairs • Law enforcement • Migratory birds
National Oceanic and Atmospheric Administration (NOAA)	Conducts weather and climate forecasts and studies. • Ohio Sea Grant • Satellite imaging • Coastal Resource Management

Table 7 - 4: State Agencies

State	
Agency	**Description**
Ohio Environmental Protection Agency (Ohio EPA)	Responsibility for water quality protection throughout Ohio. • NPDES permit approval and oversight • Wastewater treatment technical and feasibility studies • Stormwater management program and administration • Water quality monitoring (watersheds and Lake Erie) • Section 319 Grant, Surface Water Improvement Fund (SWIF), GLRI fund administration • Areas of Concern program • Harmful algal bloom program administration • TMDL studies
Ohio Department of Agriculture (ODA)	Responsibility for agricultural non-point sources. Specific areas of involvement include: • Agricultural non-point program implementation • Agriculture fertilizer applicator certification programs • CAFO permitting and regulatory oversight • Certified livestock manager training and inspections • Manure and fertilizer application enforcement • Fertilizer sales records • Watershed coordinator program administration • Agricultural non-point BMP technical assistance and oversight • Agricultural pollution abatement program • Ohio runoff risk forecast website • Conservation reserve enhancement program implementation
Ohio Department of Natural Resources (ODNR)	Responsibility for coastal program coordination, habitat, and fisheries. • Private and public lands wildlife habitat management • Posting of bathing beach advisories on state park beaches and boat ramps • Lake Erie fisheries • In-water beneficial reuse of dredged material • In-water coastal wetland for habitat restoration and nutrient reduction
Ohio State University Extension	Conducts research and educational programs, and provides extensive technical recommendations to the agricultural community.

State	
Agency	**Description**
Michigan Department of Environment, Great Lakes, and Energy (Michigan EGLE)	Responsible for water quality protection throughout Michigan. • NPDES permit approval and oversight • Wastewater treatment technical and feasibility studies • Stormwater management program and administration • Water quality monitoring (lakes and streams) • Areas of Concern program • Harmful algal bloom program administration • Wetlands protection and restoration programs administration • TMDL studies • Section 319 Grant, and GLRI fund administration
Michigan Department of Agriculture and Rural Development (MDARD)	Use a customer-driven, solution-oriented approach to • Cultivate and expand new economic opportunities for the food and agricultural sector • Safeguard the public's food supply • Inspect and enforce sound animal health practices • Control and eradicate plant pests and diseases threatening the food and agriculture system • Preserve the environment by which the farming community makes their living and feeds consumers • Protect consumers by enforcing laws relating to weights and measures.
Michigan Department of Natural Resources (Michigan DNR)	Responsible for the conservation, protection, and management of the state's natural and cultural resources. • Similar activities as ODNR
Michigan State University Extension	Conducts research and educational programs, and provides extensive technical recommendations to the agricultural community.

Table 7 - 5: Local Agencies

Local	
Agency	**Description**
Watershed Councils	Local non-profit organizations that are volunteer-based take on coordination of watershed programs to protect clean water and habitat. • Partners for Clean Streams • Duck-Otter Creek Partnership • Swan Creek Balanced Growth Committee • Wolf Creek Committee • Sandusky River Watershed Coalition • Portage River Basin Council
County Soil and Water Conservation Districts (SWCD)	Designated Management Agencies (DMAs) for agricultural pollution abatement. • Offer voluntary programs that promote the use of agricultural conservation practices and BMPs • Provide technical assistance and conduct educational programs at the local level, working directly with land owners • Support legislation essential to agricultural pollution abatement • Pursue funding from conservation programs
County Engineer / Drain Commissioner	Responsible for drainage and may have responsibilities for county roads, water supply, or sanitary sewage. • Provide technical assistance with planning and design, and oversight of construction • Provides maintenance for infrastructure • Maintains records

VIII. Habitat

Priority Agricultural Watersheds

Ohio EPA conducts water quality monitoring to assess stream attainment of water quality standards. This is commonly completed during a Biological and Water Quality Study. Waters identified as impaired, are placed on a list under Section 303(d) list of the CWA, within the Integrated Water Quality Monitoring and Assessment Report that indicates the general condition of Ohio's waters and identifies water that are not meeting water quality goals. For each impaired water, Ohio EPA typically prepares a TMDL analysis to identify causes and sources of water quality impairments (http://epa.ohio.gov/dsw/tmdl/index.aspx). The TMDL specifies the amount a pollutant needs to be reduced to meet the water quality standards, allocates pollutant load reductions, and provides the basis for taking actions needed to restore a water body. Table 7-6 shows common parameters analyzed during the development of a TMDL and sources and causes of identified impairments due to agriculture (there is no direct relationship between columns; each column is a separate list).

Table 7 - 6: Water Quality Impairments Related to Agriculture

TMDL Parameter	Sources of Impairments	Causes of Impairments
Acid	Agriculture – Row Crop	Ammonia
Alkalinity	Agriculture - Runoff	Dissolved Oxygen / Organic Enrichment
Ammonia	Agriculture – Subsurface Drainage	Flow Alteration
Atrazine	Channelization	Habitat Alteration
Bacteria	Crop Production with Subsurface Drainage	Nitrate / Nitrite
Chemical Oxygen Demand	Flow Modification	Nutrient Enrichment / Eutrophication
Chlorides	Habitat Alteration	Pesticides
Dissolved Oxygen	Manure Runoff	Phosphorus (total)
Metals	Riparian Vegetation Removal	Sediment
Nitrate		Sediment Screening (exceedance)
Pesticides		Sedimentation / Siltation
pH		Siltation
Sediment		
Total Dissolved Solids		
Total Nitrogen		
Total Phosphorus		
Total Suspended Solids		
5-day Carbonaceous Biochemical Oxygen Demand		

In many cases, the Biological and Water Quality Study and TMDL provides the only source of current water quality data for streams. As of July 2017, Ohio TMDLs approved by U.S. EPA within the 208 region included the Maumee (lower) and Lake Erie Tributaries, Portage River, Sandusky River (lower) and Bay Tributaries, Swan Creek, and Toussaint River (http://epa.ohio.gov/dsw/tmdl/index.aspx). Currently, there are several watersheds with a TMDL under development (http://epa.ohio.gov/Portals/35/tmdl/TMDL_status_July2017_TSD.pdf). In Michigan, the Surface Water Assessment Section of Michigan EGLE oversees the protection of the quality of surface waters. Michigan EGLE performs several monitoring assessments (www.mi.gov/waterquality).

This plan identifies priority watersheds (hydrologic unit code [HUC] 12 digit) based on the number of causes for water quality impairments that may be related to agricultural practices. This means the cause of an impairment is the result of a source linked to agricultural practices. Priority HUC-12 watersheds in the 208 Plan area are shown in Figure 7-7, with specific sources and causes for water quality impairments detailed in Table 7-7 (Ohio EPA 2016b).

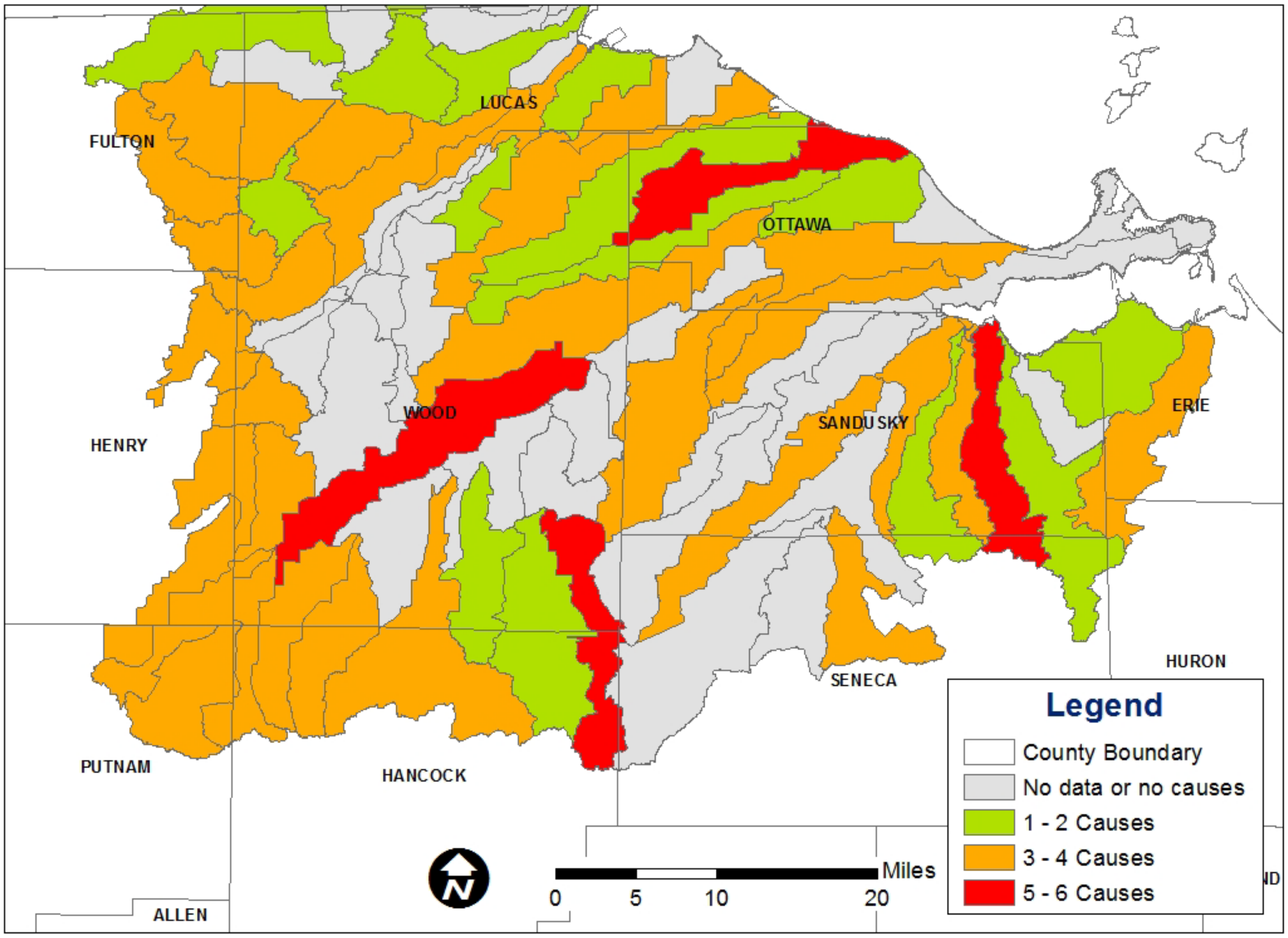

Figure 7 - 7: Priority Agricultural Watersheds

Table 7 - 7: Watershed Impairments

Watershed		**Sources**							**Causes**												
Watershed Name	**12-Digit Watersheds**	Agriculture - Row	Agriculture	Agricultural	Channelization	Manure Runoff	Riparian			Ammonia	Dissolved Oxygen	Flow Alteration	Habitat	Nitrate / Nitrite	Nutrient	Pesticides	Phosphorus	Sediment	Sediment	Sedimentation /	Siltation
Plum Creek	041000010201																				
Gray Drain	041000010203																				
Otter Creek	041000010204																				
Shantee Creek	041000010301																				
Halfway Creek	041000010302																				
Prairie Ditch	041000010303																				
Headwater Tenmile Creek	041000010304				♦															♦	
North Tenmile Creek	041000010305			♦								♦									
Heldman Ditch-Ottawa River	041000010307				♦															♦	
Sibley Creek-Ottawa River	041000010308				♦								♦							♦	
Detwiler Ditch-Frontal Lake Erie	041000010309																				
Hammer Creek	041000090502	♦			♦							♦	♦		♦						
Upper Yellow Creek	041000090504	♦			♦							♦	♦		♦						
Brush Creek	041000090505	♦			♦							♦	♦		♦						
Lower Yellow Creek	041000090506	♦			♦							♦	♦		♦						
Cutoff Ditch	041000090507	♦			♦							♦	♦		♦						
Middle Beaver Creek	041000090508	♦			♦							♦	♦		♦						
Lower Beaver Creek	041000090509	♦			♦							♦	♦		♦						
Lick Creek	041000090510	♦			♦							♦	♦		♦						
Tontogany Creek	041000090601																				
Sugar Creek-Maumee River	041000090602																				
Haskins Road Ditch	041000090603																				

Watershed		Sources							Causes												
Watershed Name	12-Digit Watersheds	Agriculture - Row	Agriculture	Agricultural	Channelization	Manure Runoff	Riparian			Ammonia	Dissolved Oxygen	Flow Alteration	Habitat	Nitrate / Nitrite	Nutrient	Pesticides	Phosphorus	Sediment	Sediment	Sedimentation /	Siltation
Ai Creek	041000090701	♦			♦								♦		♦			♦			
Fewless Creek-Swan Creek	041000090702	♦			♦								♦		♦			♦			
Gale Run-Swan Creek	041000090703	♦													♦			♦			
Upper Blue Creek	041000090801	♦			♦								♦		♦			♦			
Lower Blue Creek	041000090802	♦			♦								♦		♦			♦			
Wolf Creek	041000090803	♦			♦								♦		♦			♦			
Heilman Ditch-Swan Creek	041000090804				♦								♦		♦			♦			
Grassy Creek Diversion	041000090901																				
Grassy Creek	041000090902				♦															♦	
Crooked Creek	041000090903																				
Delaware Creek-Maumee River	041000090904				♦							♦		♦			♦			♦	
Rader Creek	041000100101	♦			♦						♦			♦			♦			♦	
Needles Creek	041000100102	♦			♦							♦	♦							♦	
Rocky Ford	041000100103	♦			♦							♦	♦							♦	
Town of Rudolph-Middle Branch Portage River	041000100104																				
Bull Creek	041000100201				♦								♦							♦	
East Branch Portage River	041000100202	♦			♦					♦		♦		♦	♦					♦	
Town of Bloomdale-South Branch Portage River	041000100203	♦			♦								♦							♦	
Rhodes Ditch	041000100204																				
Cessna Ditch-Middle Branch Portage River	041000100205																				
North Branch Portage River	041000100301	♦			♦						♦		♦	♦			♦			♦	

Watershed		Sources							Causes												
Watershed Name	12-Digit Watersheds	Agriculture - Row	Agriculture	Agricultural	Channelization	Manure Runoff	Riparian			Ammonia	Dissolved Oxygen	Flow Alteration	Habitat	Nitrate / Nitrite	Nutrient	Pesticides	Phosphorus	Sediment	Sediment	Sedimentation /	Siltation
Town of Pemberville-Portage R.	041000100302																				
Sugar Creek	041000100401	♦			♦								♦		♦					♦	
Little Portage River	041000100501	♦			♦							♦	♦		♦					♦	
Portage River	041000100502														♦		♦			♦	
Lacarpe Creek	041000100503																				
Upper Toussaint Creek	041000100601	♦			♦		♦						♦		♦						♦
Packer Creek	041000100602	♦	♦		♦										♦						♦
Lower Toussaint Creek	041000100603	♦													♦						♦
Turtle Creek-Frontal Lake Erie	041000100701	♦			♦					♦	♦		♦				♦			♦	
Crane Creek-Frontal Lake Erie	041000100702				♦												♦			♦	
Cedar Creek-Frontal Lake Erie	041000100703	♦			♦					♦	♦									♦	
Wolf Creek-Frontal Lake Erie	041000100704																				
Berger Ditch	041000100705				♦						♦						♦			♦	
Otter Creek - Frontal Lake Erie	041000100706				♦															♦	
Mills Creek	041000110103		♦												♦		♦			♦	
Frontal South Side of Sandusky Bay	041000110201	♦		♦																♦	
Strong Creek	041000110202																				
Pickerel Creek	041000110203	♦	♦																	♦	
Raccoon Creek	041000110204	♦											♦	♦	♦	♦	♦			♦	
South Creek	041000110205	♦													♦		♦	♦		♦	
Snuff Creek	041000111003																				
Plum Run	041000111004																				
Spicer Creek	041000111105	♦		♦		♦					♦				♦		♦				
Flag Run-Green Creek	041000111203			♦																♦	

Watershed		Sources							Causes												
Watershed Name	12-Digit Watersheds	Agriculture - Row	Agriculture	Agricultural	Channelization	Manure Runoff	Riparian			Ammonia	Dissolved Oxygen	Flow Alteration	Habitat	Nitrate / Nitrite	Nutrient	Pesticides	Phosphorus	Sediment	Sediment	Sedimentation /	Siltation
Muskellunge Creek	041000111301			♦											♦		♦			♦	
Indian Creek	041000111302																				
Yellow Swale	041000111303			♦	♦								♦		♦		♦			♦	
Greis Ditch	041000111401																				
Town of Helena-Muddy Creek	041000111402																				
North Side Sandusky Bay Frontal	041000111405																				

IX. Best Management Practice Funding Programs

Federal and state agencies, such as USDA, ODNR, Ohio EPA, ODA, and SWCDs cooperate and jointly provide assistance to farmers through various programs to address non-point pollution control and habitat restoration. These programs use two techniques to implement their goals: 1) Provide technical expertise from professional staff who advise farmers on appropriate BMPs to facilitate conservation of natural resources and make farming profitable, and 2) Provide financial incentives for participating in voluntary use of BMPs, known as cost sharing. Program summaries are provided below:

Agricultural Conservation Easement Program (ACEP)

The USDA-NRCS administers the ACEP as a voluntary conservation program to provide financial and technical assistance to help protect, restore and enhance critical wetlands and agricultural lands. Under the Land Easements component, the program assists American Indian tribes, state, and local governments and non-governmental organizations to protect working agricultural lands and limit non-agricultural use of the land. Under the Wetlands Reserve Easements component, the program assists to restore, protect, and enhance wetlands.

The 2014 Farm Bill replaced the Wetland Reserve Enhancement Program with the Wetland Reserve Enhancement Partnership (WREP), which continues to provide the following benefits:

- Wetland restoration and protection
- Ability to cost-share restoration or enhancement beyond NRCS requirements
- Ability to participate in the management or monitoring of selected project locations
- Ability to use innovative methods and practices

Additional information on ACEP is available at:

https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/easements/acep/?cid=stelprdb1242695

Conservation Reserve Program (CRP)

The USDA-FSA administers the CRP as a voluntary program for agricultural landowners. The program provides land rental payments to farmers who agree to remove environmentally sensitive land from agricultural production and plant species that will improve environmental health and quality. Agricultural land may be converted to filter strips, riparian forest buffers, wetlands, windbreaks, or other. Contracts through the program may be 10-15 years in length. The long-term goal of the program is to re-establish valuable land cover to help improve water quality, prevent soil erosion, and reduce loss of wildlife habitat. Additional information about CRP is available at:

- https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/index

Conservation Reserve Enhancement Program (CREP)

The USDA-FSA administers the CREP as part of the CRP. CREP targets high priority conservation concerns identified by a state, and federal funds are supplemented with non-federal funds to address those concerns. For example, the CREP is offered only to areas in the Lake Erie basin within Ohio. In exchange for removing environmentally sensitive land from production and establishing permanent resource conserving plant species, farmers and ranchers are paid an annual rental rate along with other federal and state incentives as applicable per each CREP agreement. Participation is voluntary, and the contract period is typically 10–15 years. Additional information about CREP is available at:

- https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-enhancement/index

Environmental Quality Incentive Program (EQIP)

The USDA-NRCS administers the EQIP as a voluntary conservation program for agricultural producers who face challenges with natural resources, such as soil, water, and air. The program provides financial and technical assistance to agricultural producers through contracts up to a maximum term of 10 years in length. Contracts provide assistance to help plan and implement conservation practices that address natural resource concerns to improve and conserve soil, water, plant, animal, air and related resources on agricultural land and non-industrial private forestland. EQIP also helps producers meet federal, state, and local environmental regulations. Types of conservation practices implemented by EQIP are generalized below:

- Cropland Soil Quality
- Fish and Wildlife Habitat
- Forest Land Conservation
- Irrigation Efficiency
- Water Quality
- Wetlands

Additional information about EQIP is available on the following websites:

- https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/
- https://www.nrcs.usda.gov/Internet/NRCS_RCA/reports/fb08_cp_eqip.html

Clean Water Act §319 Non-Point Source Grants

Ohio EPA and Michigan EGLE offer financial assistance to implement activities through their Non-point Source Pollution Control programs. These programs were established because of the 1987 amendments to the Clean Water Act that created a national program to control non-point source pollution under Section 319 of the Act. The goal of the program is to restore waters impaired by non-point source pollution and protect high quality waters from degradation. The 319 grants are a significant resource for the TMACOG region because they have funded many educational, planning, and cost share projects. Additional information about the 319 grants in Ohio and Michigan is available on the following websites:

- http://epa.ohio.gov/dsw/nps/index.aspx#120979052-background
- http://www.michigan.gov/deq/0,4561,7-135-3307_3515-314500--,00.html

ODNR Cost Share Eligible Practices

Ohio Administrative Code 1501:15-5-13 enables ODNR Division of Soil and Water Resources to provide cost share funding to assist landowners through the Agricultural Pollution Abatement Cost Sharing Program. The program focuses on installing BMPs that abate manure pollution, soil erosion, or degradation of the waters of the state by soil sediment. Available information about the ODNR Cost Share Eligible Practices is available at http://codes.ohio.gov/oac/1501:15-5-13. Further details should be requested from ODNR.

Northwest Ohio Windbreak Program

The NW Ohio Windbreak program is an interagency effort of USDA, ODNR, and county SWCDs to assist land owners in establishing field windbreaks. Applications may be made through the County SWCDs or ODNR Divisions of Forestry or Wildlife. The program provides cost share funds to landowners for establishing windbreak vegetation and covers a total of 15 counties on a rotating basis. The program is available in Ottawa and Sandusky counties in even years, and in Lucas and Wood counties every year.

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Chapter 8: Stormwater Management

I. Introduction

Historically, water pollution control has focused on obvious point sources: municipal wastewater treatment plants (WTTPs) and industrial discharges that flow from a pipe directly to a water body. While most point source pollutants have been addressed through the early focus of the 1972 Clean Water Act (CWA), water quality issues caused by runoff from the built environment were largely ignored until a 1987 amendment to the CWA. The pollution potential for urban stormwater runoff was not fully appreciated until repeated studies revealed that urban non-point sources seriously threaten water quality and can exceed the impact of municipal sewage discharges. Now, the more difficult non-point sources must be dealt with to continue to improve our water resources.

Non-point problems are both water quality and quantity based. Development of an area changes the landscape, replacing natural vegetation with less permeable surfaces that prevent rainwater and snowmelt from following their natural course into the soil. Roofs and pavement completely prevent infiltration, while even suburban lawns absorb far less than natural areas. As rainwater runs over impervious surfaces, it carries a multitude of pollutants from the land directly to storm drains, rivers, and streams. Impervious surfaces also increase the rate and volume of stormwater runoff, resulting in higher flows and more frequent floods. In Swan Creek (Lucas County), flood flows have increased up to 85 percent from pre-settlement times. The elevated flows increase the erosion of waterway beds and banks (Earthview, 1973). Other negative impacts include increasing the receiving waters' temperature, changing habitat, and decreasing stream flow stability.

To reduce the water quality impacts of stormwater runoff and reverse some of the damage that has been done to the Nation's surface waters, the U.S. Environmental Protection Agency (U.S. EPA) requires that municipalities and other entities control the volume and pollutant loads of stormwater entering local waterways. This chapter details the regulatory framework for stormwater pollution control and recommends implementation policies for local governments to meet regulatory requirements and protect streams from pollution by urban runoff.

II. History of Drainage in the TMACOG Region

Drainage in the TMACOG planning area has historically been poor, due primarily to lack of relief and a low density of natural streams to drain the land. Except for western Lucas County, the region was largely characterized by swamp forest and marshland. The area was historically referred to as "The Great Black Swamp." Ditch laws passed in the 1860s gave county commissioners in Ohio and Michigan the authority to construct, enlarge, and deepen natural streams and man-made ditches. An extensive ditch system was installed, providing an integrated drainage system for the area that permitted agricultural land uses and settlement.

In the late 19th century, the need for rapid transport of sanitary wastes had become increasingly apparent. In the urban centers, the drainage efforts intensified with engineered systems of underground pipes carrying both sanitary waste and stormwater. Storm sewer ordinances were amended to allow disposal of sanitary wastes via the storm sewers and construction of these combined sewer systems became an accepted practice. The serious pollution and health risks were not realized until populations increased, and treatment of the wastewater became essential. More recently, constructed stormwater and wastewater collection systems have been separate systems and many older urban areas are under EPA mandates to prevent combined sanitary and stormwater discharges into waterways. Nevertheless, many combined sewers are still in use in older urban areas.

III. Stormwater Pollution

Stormwater pollution sources are diffuse and not easily identified, with pollutants generated through activities distributed across an entire landscape, rather than contained within a facility. Most land use activities deposit detrimental and sometimes hazardous materials on the impervious surfaces: sediments (dust and sand), toxic metal particles, pesticides, fertilizers, petroleum products, harmful bacteria, salt, pet waste, and trash. As rainfall and snowmelt move rapidly across transformed landscapes, these pollutants are carried to surface and underground collection systems. Eventually these polluted flows reach waters that we use for drinking, swimming, fishing, and recreation. See Table 8-1 for more examples of stormwater contaminants.

Table 8 - 1: Categories of Primary Stormwater Contaminants

Category	Examples
Metals	Zinc, Cadmium, Copper, Chromium, Arsenic, Lead
Organic Chemicals	Pesticides, Oil, Gasoline, Grease
Pathogens	Bacteria, Viruses, Protozoa
Nutrients	Phosphorous, Nitrogen
Biochemical Oxygen Demand (BOD)	Grass clippings, Hydrocarbons, Animal waste, Fallen leaves
Sediment	Sand, Soil, Silt
Salts	Sodium Chloride, Calcium Chloride
Source: Bannerman et al., 1993.	

Illicit or illegal connections to the storm sewers from homes and businesses introduce pollutants and pathogens to the storm sewers that are released without appropriate treatment. Sources of illicit discharges include, but are not limited to sanitary wastewater, effluent from septic tanks, car wash, laundry, household waste, and other waste products. Industrial facilities often negligently discharge wastewater that should be directed to the sanitary sewers into floor drains, and dry wells, which feed into their stormwater system. The result is untreated discharges that contribute high levels of pollutants into receiving waterbodies.

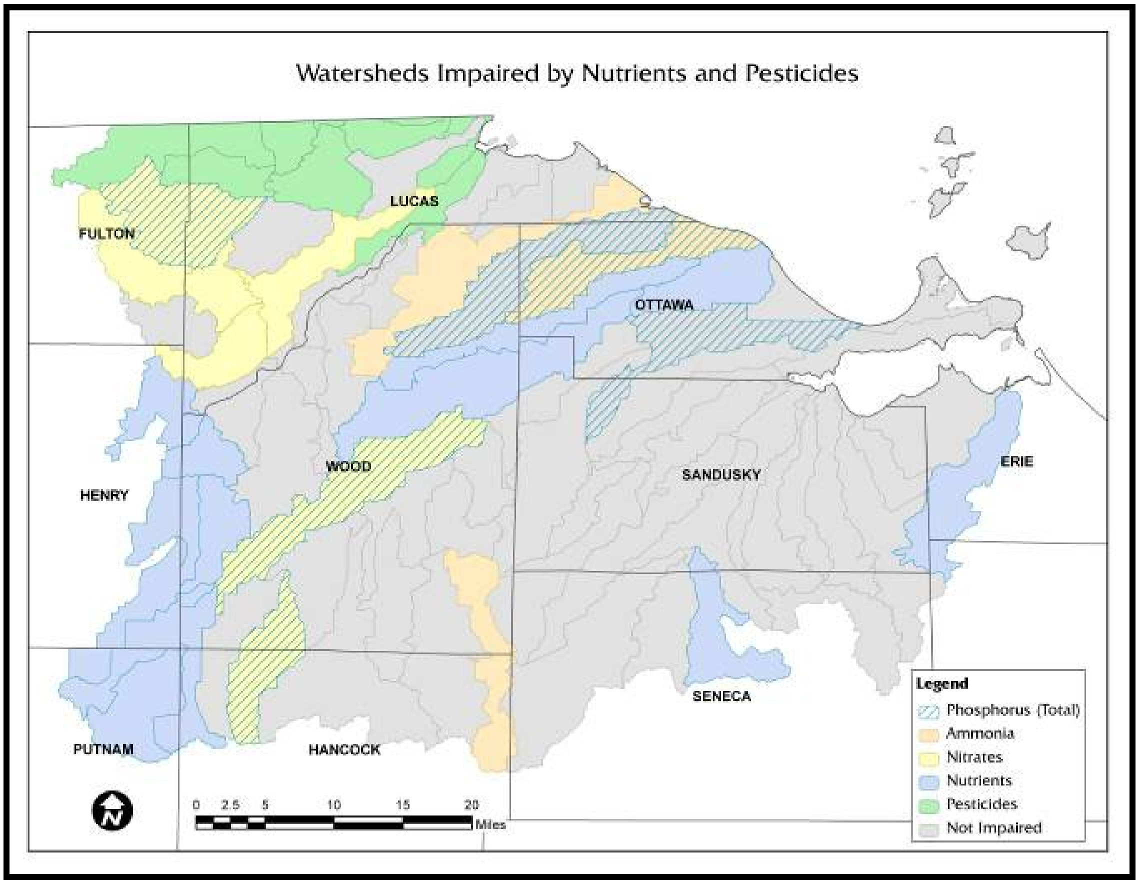

Figure 8 - 1: Watershed Impairment Caused by Nutrients and Pesticides in the TMACOG Region

In municipal, commercial and residential settings, incorrect application and storage of landscaping fertilizers or pesticides are a common source of stormwater pollution. Rain and melting snow can erode piles of stored materials such as sand, loose topsoil, or road salt that is left uncovered. Similarly, precipitation can flush contaminants off unwashed equipment stored outside. These common pollutants can degrade the quality of receiving waters, almost to the same degree as if they were introduced by direct discharge, causing water quality impairments in watersheds. Figure 8-1 highlights the watersheds that are affected by common landscaping pollutants such as nitrates, pesticides, and nutrients,

As impervious surfaces replace a watershed's natural areas, the effect on the volume of stormwater runoff is dramatic. For example, a one-inch rainstorm on a 1-acre natural meadow produces approximately 218 cubic feet of runoff. The same storm over a 1-acre paved parking lot would produce almost 16 times that volume of runoff. The proliferation of hard surfaces not only changes the volume of stormwater flows, but also the distribution of flows over time. The stormwater is forced off the land immediately, causing much sharper peaks in runoff. These "flashy" flows can lead to problematic changes in the hydraulics of the system. These flows cause larger and more frequent floods and increase erosion of stream banks and beds. Eroded banks, in turn, have caused damage to adjacent property and present safety hazards. The higher flows also result in increases in stream temperature, changes in habitat, and decreases in stream flow stability, impacting aquatic life (Table 8-2).

Table 8 - 2: Impacts from Increases in Impervious Surfaces

Increased Imperviousness Leads to:	Resulting Impacts				
	Flooding	Habitat Loss	Erosion	Channel Widening	Streambed Alterations
Increased volume	●	●	●	●	●
Increased peak flow	●	●	●	●	●
Increased peak flow duration	●	●	●	●	●
Increased stream temperature		●			
Decreased base flow		●			
Increased sediment loadings	●	●	●	●	●
Source: USEPA, 1997					

Research has shown that when impervious cover reaches between 11 and 25 percent of the area of a watershed, hydrological and ecological stresses become apparent (Schueler, 1994). As shown in Figure 8-2, six sub-watersheds (smaller divisions of larger watersheds, also known as 12-digit hydrologic units) in the region have above 10% imperviousness. A second threshold appears to exist at 26% impervious cover, where most indicators of stream quality consistently shift to a poor condition (e.g., diminished aquatic diversity, water quality, and habitat scores). Four watersheds in the region are above the 26% impervious cover threshold. Established urban areas in the region are estimated to have 30-35% impervious surface area.

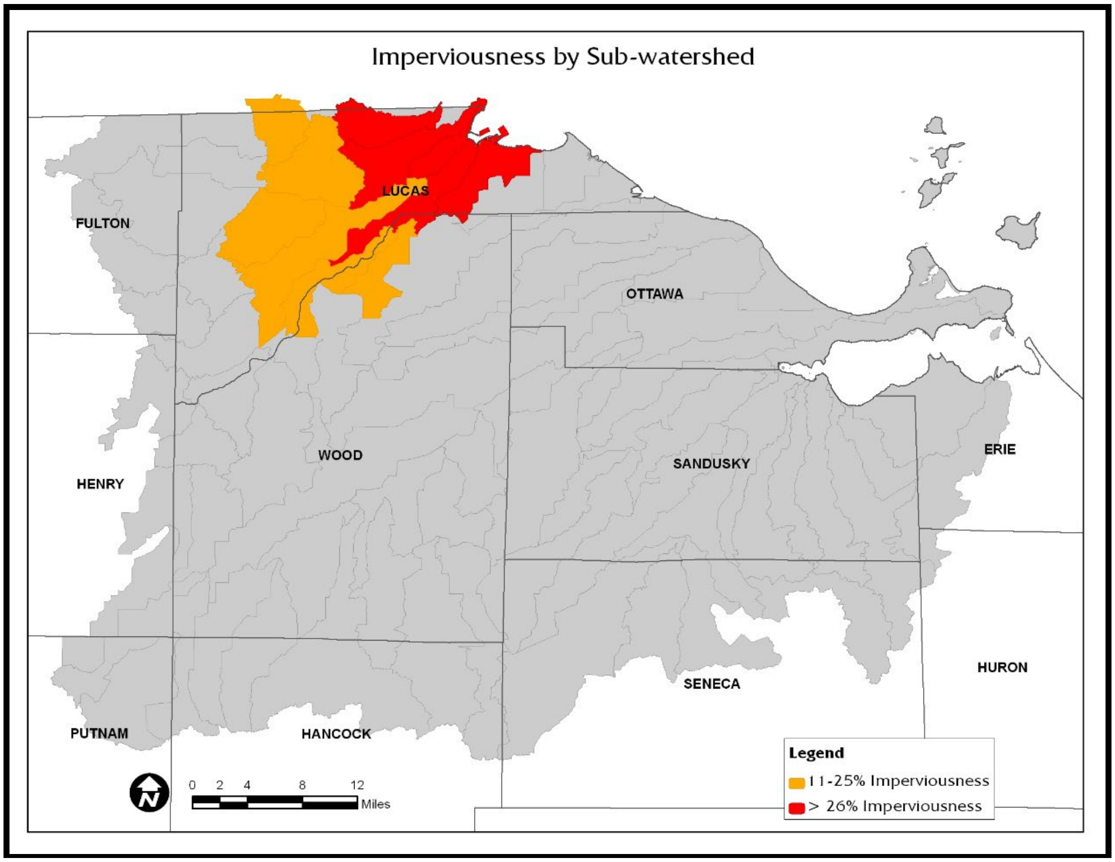

Figure 8 - 2: Urban Imperviousness by Subwatershed
Source: USGS Multi-Resolution Land Characteristics Consortium (MRLC);
http://www.mrlc.gov/multizone_download.php?zone=11

In many communities, most impervious cover is related to transportation infrastructure – streets, roads and parking lots. Not only does transportation infrastructure produce some of the highest concentrations of hydrocarbons, suspended solids (sediment) and bacteria, but it also generates a disproportionate amount of runoff volume from the watershed (Bannerman et al., 1993). Automobiles contribute several different types of pollutants to urban runoff. High levels of metals are found in tire wear, used motor oil and grease, diesel fuel, and vehicle rust. Engine coolants and antifreeze are toxic and can contribute to high biological oxygen demand (BOD) in the receiving waters. Fossil fuel combustion is a large contributor of nitrogen to the waters in urbanized areas of the U.S. Salts are used to keep facilities free of ice, but in large volumes can be toxic to fish and other wildlife.

Of concern for water quality, are soluble metals, which are much more likely to exert a toxic effect on aquatic life and are not easily removed by natural processes. Table 8-3 identifies common metals associated with the transportation. In the 208 region, metals are responsible for impairment in the Sibley Creek-Ottawa River Watershed (Figure 8-3). These pollutants accumulate on impervious surfaces during dry weather conditions, only to form a concentrated first flush during storm events. Impervious surface and parking lot runoff is a source of impairment in several watersheds in the region (see the section "Complete Watershed-Based Planning & Coordination" in this chapter).

Table 8 - 3: Sources of Heavy Metals from Transportation

Source	Cadmium	Cobalt	Copper	Iron	Manganese	Nickel	Lead	Zinc
Gasoline	●		●				●	●
Exhaust						●	●	
Motor Oil & Grease		●		●		●	●	●
Antifreeze				●				●
Undercoating							●	●
Brake Linings			●	●		●	●	●
Tire Wear	●		●				●	●
Asphalt			●			●		●
Concrete			●			●		●
Diesel Oil	●							
Engine Wear					●	●	●	●
Source: Terrene Institute and USEPA, 1995								

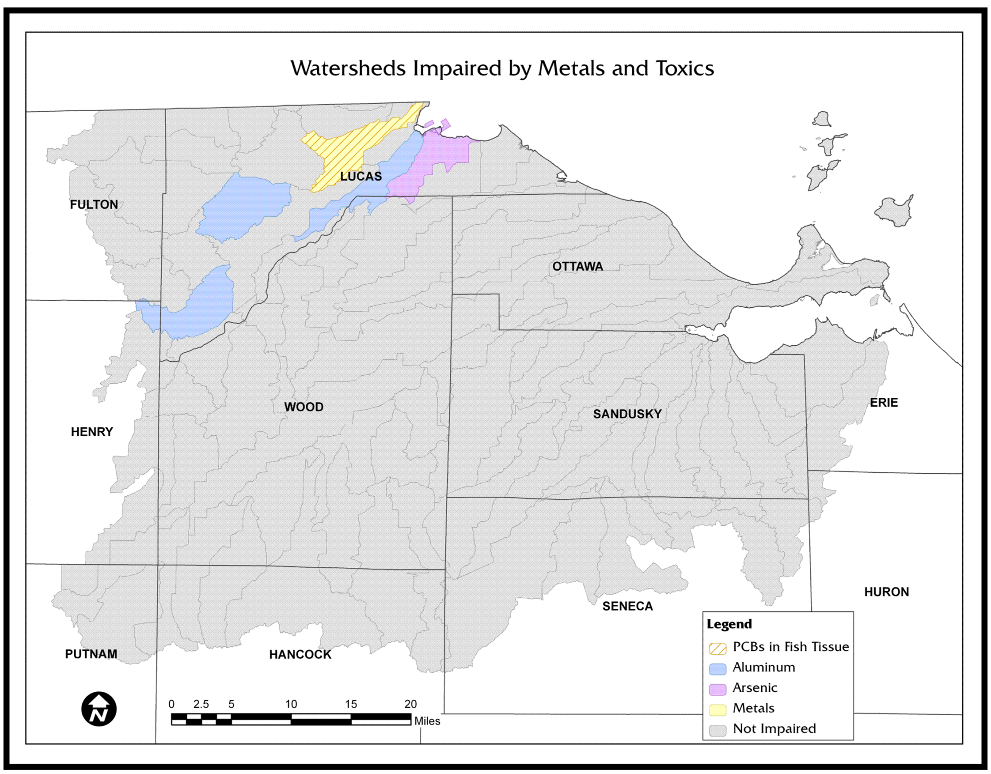

Figure 8 - 3: Watersheds Impaired by Metals and Toxics

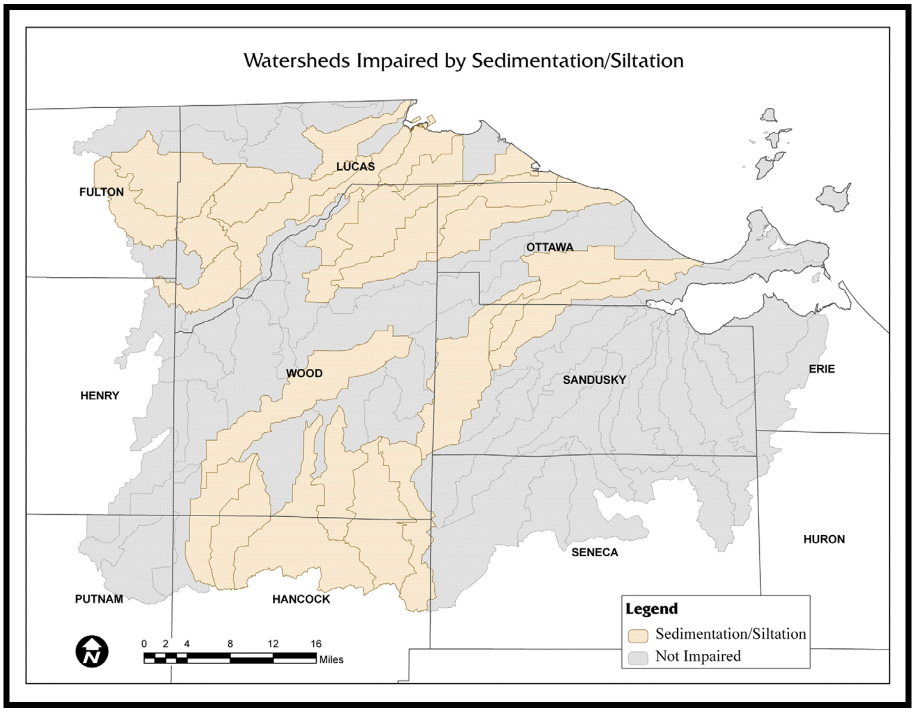

Figure 8 - 4: Watersheds Impaired by Sedimentation in the TMACOG Region

Erosion rates from construction sites are significantly greater than rates from almost any other land use. Field studies and erosion models have shown that erosion rates from construction sites are typically an order of magnitude larger than row crops and several orders of magnitude greater that rates from well-vegetated areas such as forest or pastures (U.S. EPA, 1999). Excess sediment causes several problems for waterbodies. Suspended sediments increase turbidity and reduce light penetration in the water column, which directly impacts aquatic organisms. Long-term effects of sedimentation include habitat destruction and increased difficulty in filtering drinking water. Watersheds impaired by sedimentation and siltation in the 208 region are shows in Figure 8-4.

IV. Critical Urbanizing Watersheds

To address the water quality impairments caused by expanding urbanized areas, this Plan recommends priority areas, identified as Critical Urbanizing Watersheds. This designation is intended to prioritize watersheds that are undergoing urbanization and meant only to be used by this Plan. Watershed designations are based on three criteria:

- Ohio Environmental Protection Agency (Ohio EPA) or Michigan Department Environment, Great Lakes, and Energy (Michigan EGLE) classify streams as non-point source "impaired." Urban runoff and other urban sources such as construction sites are identified as being known or suspected sources for the nonpoint source impact/impairment.
- The watershed is undergoing rapid urban development and/or is under pressure for development.
- Sensitive or unique habitat or natural resources in the watershed are threatened because of urban development, such as the Oak Openings Region (Refer to TMACOG Areawide Water

Quality Management Plan, **Chapter 3** “Environmental Policies” — Section on “Policy and Goal Statements” for more information).

Watershed Impairments Resulting from Urban Causes and Sources

The Ohio EPA Integrated Water Quality Monitoring and Assessment Report contains information about the causes and sources of water quality impairments in the TMACOG 208 region watersheds (Ohio EPA,). This data can be used for watershed-based planning efforts because it identifies areas that are impaired because of a certain activity or pollutant. Figures 8-5 through 8-8 highlight the sources of impairment that are typically related to urban activities or stormwater runoff. It is recommended that communities target these sources in impaired watersheds for planning efforts and apply related stormwater best management practices (BMPs) to help remedy the impairment.

Figure 8-10 shows watersheds that drain high growth jurisdictions (defined in this Plan as jurisdictions with greater than five percent population) and have at least one source or cause of impairment that is related to urban stormwater runoff (based on 2009 population estimates). The watersheds shown in blue are the critical urbanizing watersheds with two or more stormwater-related impairments.

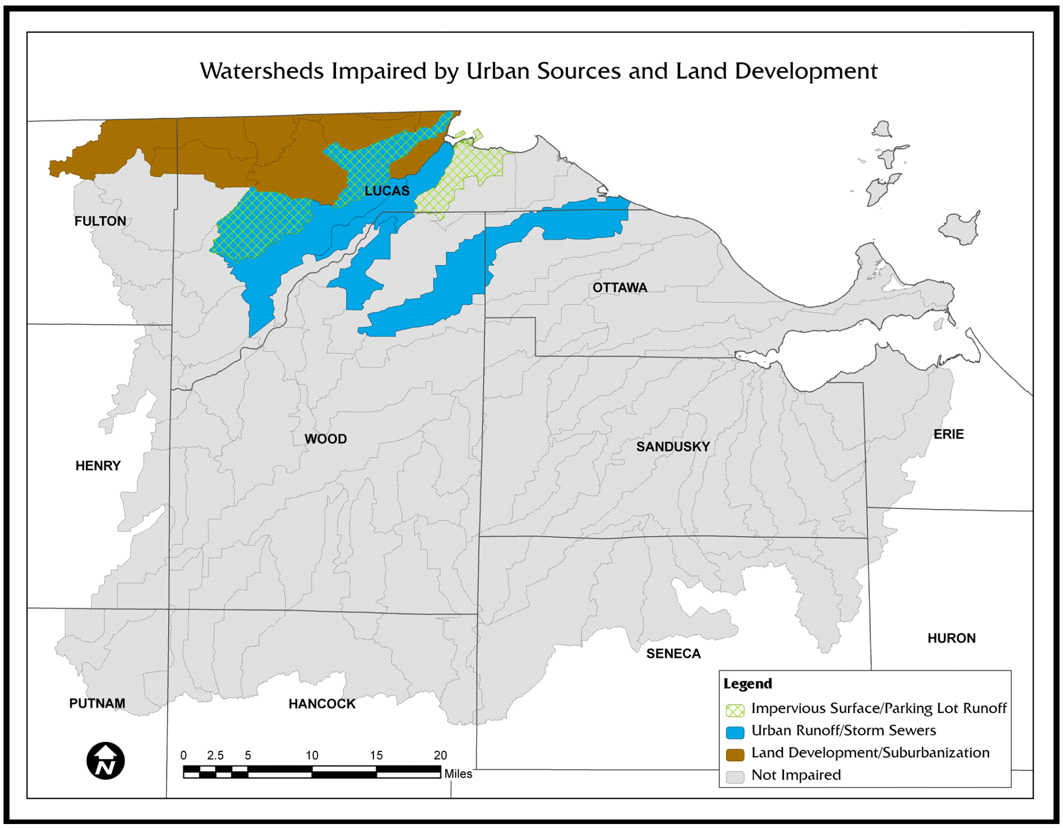

Figure 8 - 5: Watersheds Impaired by Urban Sources and Land Development

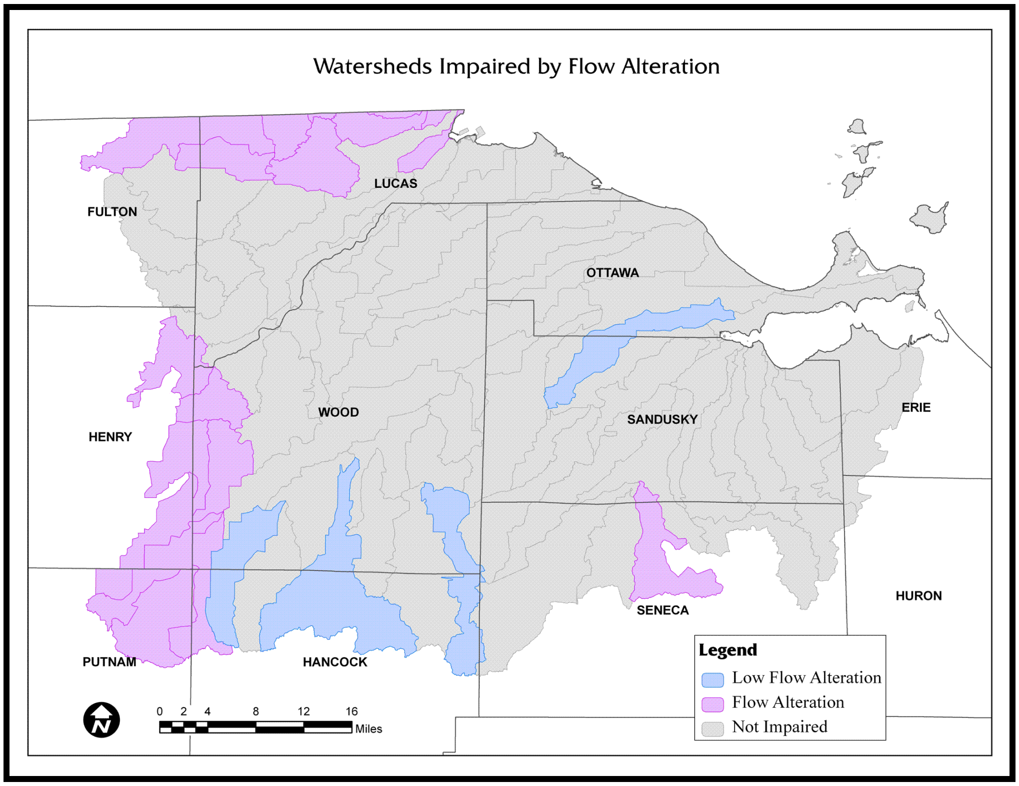

Figure 8 - 6: Watersheds Impaired by Flow Alteration

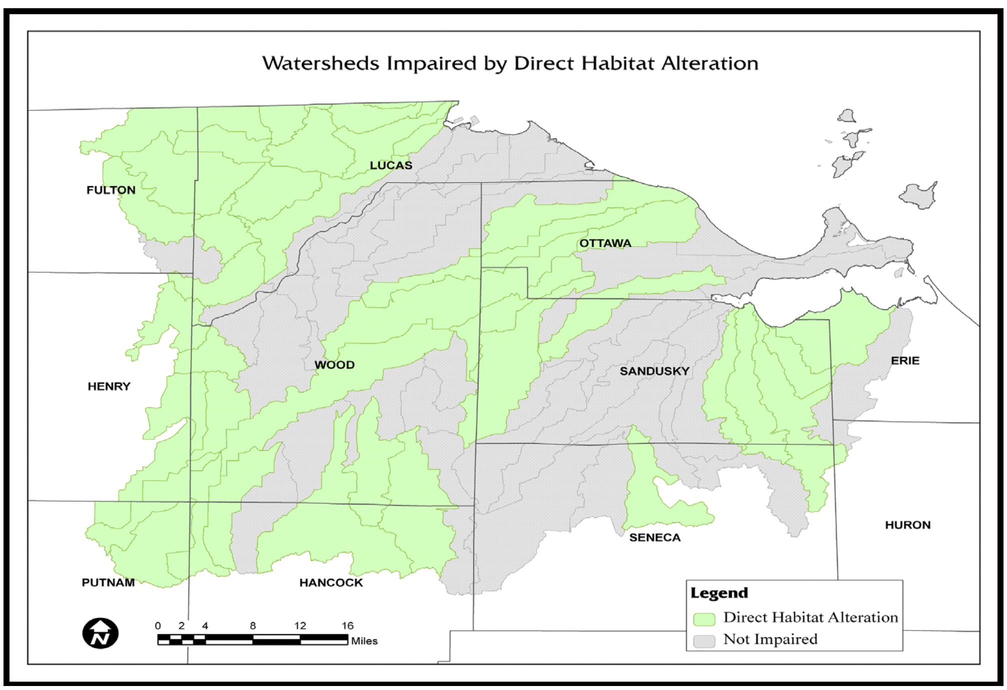

Figure 8 - 7: Watersheds Impaired by Direct Habitat

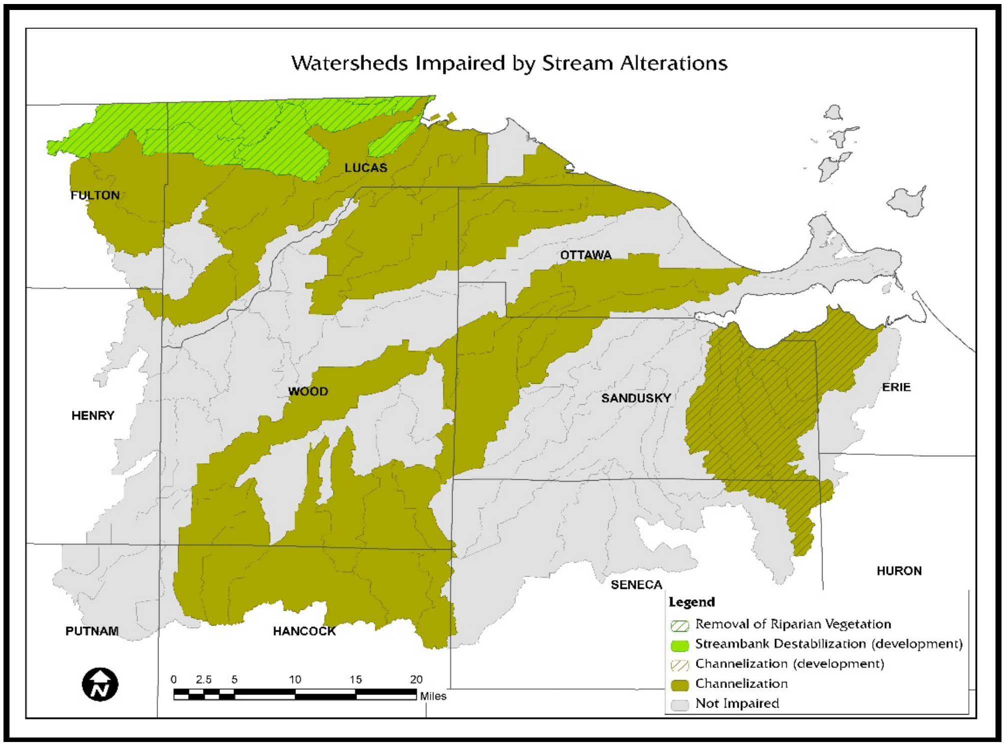

Figure 8 - 8: Watersheds Impaired by Stream Alterations

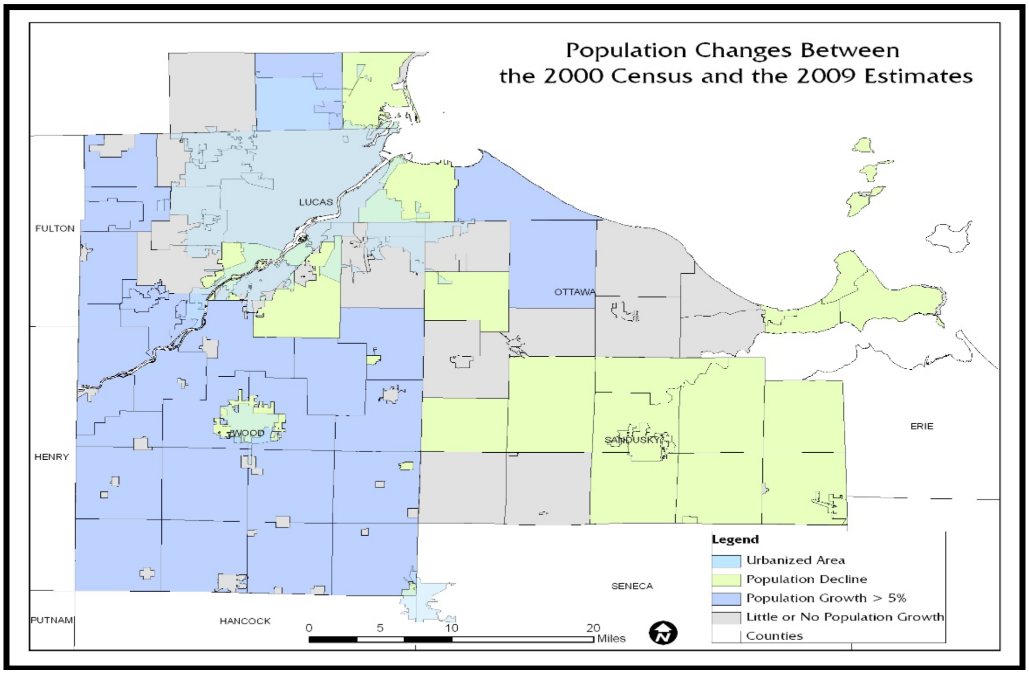

Figure 8 - 9: Population Changes 2000-2009

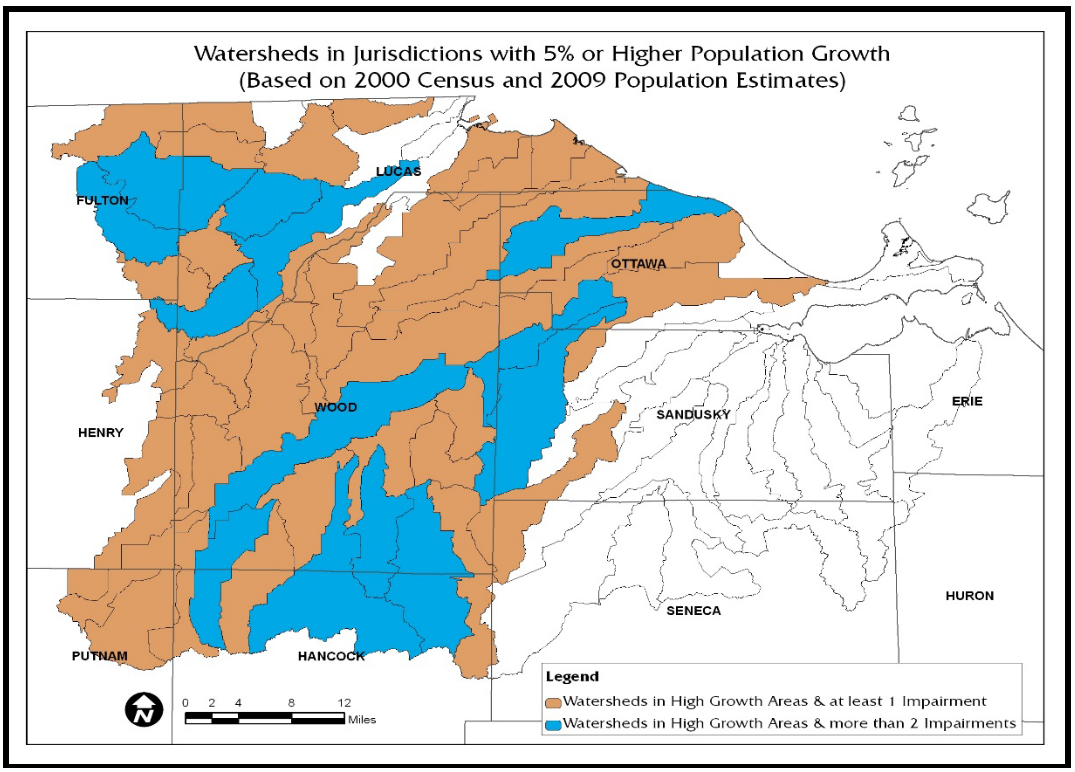

Figure 8 - 10: Critical Urbanizing Watersheds

V. Stormwater Regulations & Policies

There are two different types of laws that help control urban runoff: one focusing on urban point sources and the other focusing on urban nonpoint sources. The National Pollution Discharge Elimination System

(NPDES) permit program of the Federal CWA, which regulates stormwater discharges, addresses urban point source pollution. Nonpoint source management programs under Section 319 of the CWA cover urban nonpoint source pollution. The Total Maximum Daily Load (TMDL) program deals with both point and nonpoint sources of pollution in watersheds with degraded water quality. In the Lake Erie coastal zones, programs to protect coastal waters from nonpoint source pollution also are required by section 6217 of the Coastal Zone Act Reauthorization Amendments.

National Pollution Discharge Elimination System Stormwater Program

The CWA prohibits the discharge of any pollutant to waters of the U.S. from a point source unless the discharge is authorized by an NPDES permit. The NPDES permitting program is designed to track point sources, monitor the discharge of pollutants from specific sources to surface waters, and require the implementation of the controls necessary to minimize the discharge of pollutants. Initial efforts to improve water quality under the NPDES program primarily focused on reducing pollutants in industrial process wastewater and discharges from municipal sewage treatment plants.

As pollution control measures for point sources were implemented and refined, studies showed that more diffuse sources of water pollution were also significant causes of water quality impairment, specifically, stormwater runoff draining from large surface areas, such as urbanized land. In 1987, the CWA was again amended by Congress to require implementation of a comprehensive national program for addressing problematic non-agricultural sources of stormwater discharges. As required by the amended Act, the NPDES Stormwater Program has been implemented in two phases. Phase I requires NPDES permits for stormwater discharges from:

- Ten categories of industrial activity
- Construction activity disturbing five acres of land or greater, and
- “Medium” and “large” municipal separate storm sewer systems (MS4s) serving populations of 100,000 or greater,

The 1999 Phase II of NPDES expanded stormwater permitting by requiring additional MS4 operators and operators of small construction sites to control stormwater pollution through the NPDES program.

Regulated entities under both Phase I and Phase II must obtain coverage under an NPDES stormwater permit and implement stormwater pollution prevention plans (SWPPPs) and stormwater management programs (SWMPs), using BMPs, which effectively reduce or prevent the discharge of pollutants into receiving waters.

To implement the NPDES program, U.S. EPA published initial permit application requirements in the *Federal Register* on November 16, 1990. As NPDES delegated states, Ohio EPA and Michigan EGLE implement the federal stormwater program. Ohio and Michigan have different regulatory authorities for NPDES programs.

NPDES Industrial Permitting

To minimize the impact of stormwater discharges from industrial facilities, the NPDES program includes an industrial stormwater permitting component that covers 10 categories of industrial activity that require authorization under an NPDES industrial stormwater permit for stormwater discharges. This coverage is also provided by the local permitting authority (Ohio EPA or Michigan EGLE).

NPDES Permitting for Construction

Initial permit coverage for construction activities included those sites that disturbed greater than five acres of land. With Phase II of the NPDES permit, the U.S. EPA expanded construction site permit coverage to include small construction sites that result in a land disturbance between 1.0 and 5.0 acres or sites smaller than 1.0 acre that are part of a larger plan of development that will result in a total disturbance of 1-5 acres. Operators of small construction activities may obtain waivers from coverage, which can only be issued by the permitting authority if operators can certify low predicted rainfall potential using the approved method (U.S. EPA, 2012a) or the permitting authority determines that that stormwater controls are not necessary based on existing water quality conditions (U.S. EPA, 2005).

Construction activities meeting above criteria are required to manage stormwater and prevent pollution onsite. Some of these requirements include sediment and erosion controls, controls for runoff volume and velocity, minimizing soil exposure during construction, stabilizing disturbed soils, removing sediment from stormwater discharges, preventing discharges of waste materials, and providing stream buffers (Ohio EPA, 2013).

NPDES Permitting for MS4: Phase I

At the local level, the City of Toledo is the only entity in the TMACOG planning area that is affected by the MS4 portion of the Phase I rule. Toledo was issued an NPDES permit for its MS4 discharges, first effective on September 1, 1997. The permit needs to be renewed every five years. Ohio EPA and the City of Toledo work cooperatively to implement the requirements of the City's NPDES stormwater permit. These requirements include:

- Establishing the City's legal authority to control discharges to and from the City of Toledo MS4.
- Developing and implementing a SWMP to reduce the discharge of pollutants and protect water quality per the requirements of the ORC 6111 and the CWA. The SWMP is divided into six program areas called minimum control measures (MCMs):
    1. Public Education and Outreach on Stormwater Impacts
    2. Public Involvement and Participation
    3. Illicit Discharge Detection and Elimination
    4. Construction Site Stormwater Runoff Control
    5. Post-Construction Storm Water Management in New Development and Redevelopment
    6. Pollution Prevention/Good Housekeeping for Municipal Operations
- Achieve the objectives in the City's SWMP through implementation of stormwater BMPs aimed at addressing specific water quality impairments in the City's watersheds.

NPDES Permitting for MS4s: Phase II

In 1999, Phase II of the NPDES program expanded stormwater permitting requirements to operators for small MS4s, which are those serving populations of less than 100,000. Small MS4s can be designated for NPDES permitting in one of three ways. The first is "Automatic Nationwide Designation", which requires coverage for all owners and operators of small MS4s within Urbanized Areas as identified by the most recent decennial U.S. Census. The second method requires local permitting authorities (Ohio EPA and

Michigan EGLE) to designate additional MS4s outside of the Urbanize Area if they are significant contributors of pollutants, are densely populated, are contiguous to a highly populated area, or exhibit high growth potential. This local designation applies specifically to small MS4s serving a population of at least 10,000 with a population density of at least 1,000 persons per square mile. These communities are referred to as "Appendix 7" communities. The third method of Phase II designation requires local permitting authorities to designate any small MS4 outside of the Urbanized Area that directly discharges to a regulated MS4.

Operators of automatically designated small MS4s may obtain waivers from coverage if their discharges meet criteria under two options. The first option allows for a waiver in cases where 1) an MS4 serve less than 1,000 people, 2) the system does not contribute significantly to a regulated system, and 3) stormwater controls are not needed based on waste load allocations identified in a TMDL (discussed in more detail in next section) study. The second option allows an exception in cases where 1) the MS4 serves fewer than 10,000 people, 2) an evaluation of all waters of the U.S. that receive a discharge from the system shows that stormwater controls are not needed based on waste load allocations identified in a TMDL, and 3) it is determined that future discharges from the small MS4 do not have the potential to result in exceedances of water quality standards. Waivers must be reviewed by the permitting agency a minimum of every five years (U.S. EPA, 2012b).

Operators of Phase II MS4s are required to apply for NPDES permit coverage and implement "Six Minimum Control Measures" similar to those listed above for Phase I MS4s. Phase II permittees are required to address the abovementioned minimum control measures with BMPs aimed at addressing pollutants of concern and water quality impairments as defined in a TMDL report for each watershed in an MS4. While the Minimum Control Measures remain the same between the Phase I and Phase II permittees, methods for implementation and level of responsibility is different between the two types of MS4 NPDES permit.

About 280 jurisdictions located in urbanized areas that operate an MS4 are included in the State of Ohio program. Table 8-4 identifies MS4s in the 208 region that are required to obtain NPDES permits as of 2015 based on 2010 Urban Area boundaries. Figure 8-11 shows the jurisdictions in the 208 region that are subject to NPDES stormwater permits.

Stormwater permits are required for MS4s, but the management practices for Phase I and II communities are applicable and encouraged in non-regulated MS4s as well. The six minimum control measures (Public Education and Outreach, Public Involvement/Participation, Illicit Discharge Detection and Elimination, Construction or Post-Construction Runoff Controls, and Pollution Prevention/Good Housekeeping) can be met using applicable BMPs. In 2021 Ohio EPA made major changes to the Small MS4 General Permit that require MS4s to address specific pollutants listed in TMDLs through pollutant specific performance standards and through education and outreach programs.

Table 8 - 4: Designated Stormwater NPDES Communities

Separate Permits – Municipalities	Joint Permit Holders – Co-permittees
Lucas County, OH	
City of Toledo (under Phase I)	Lucas County
City of Oregon	Jerusalem Township
City of Sylvania	Monclova Township
City of Maumee	Spencer Township
	Springfield Township
Village of Ottawa Hills	Swanton Township
	Sylvania Township
Village of Swanton (Partially in Lucas County)	Washington Township
	Waterville Township
	Village of Holland
	Village of Whitehouse
	City of Waterville
Wood County, OH	
Bowling Green	Wood County
Fostoria (Partially in Wood County)	Lake Township
City of Northwood	Perrysburg Township
City of Perrysburg	Middleton Township
	Troy Township
	Village of Millbury
	Village of Walbridge
	City of Rossford
Ottawa County, OH	
	Ottawa County
	Allen Township
	Clay Township
Sandusky County, OH	
City of Fremont	
Monroe County, MI	
Monroe County Drain Commission	
Bedford Township	
Erie Township	
Non-Traditional MS4s	
Ohio Department of Transportation, Ohio Turnpike, Michigan Department of Transportation	
University of Toledo Main Campus, Health Science & Scott Park Campuses	

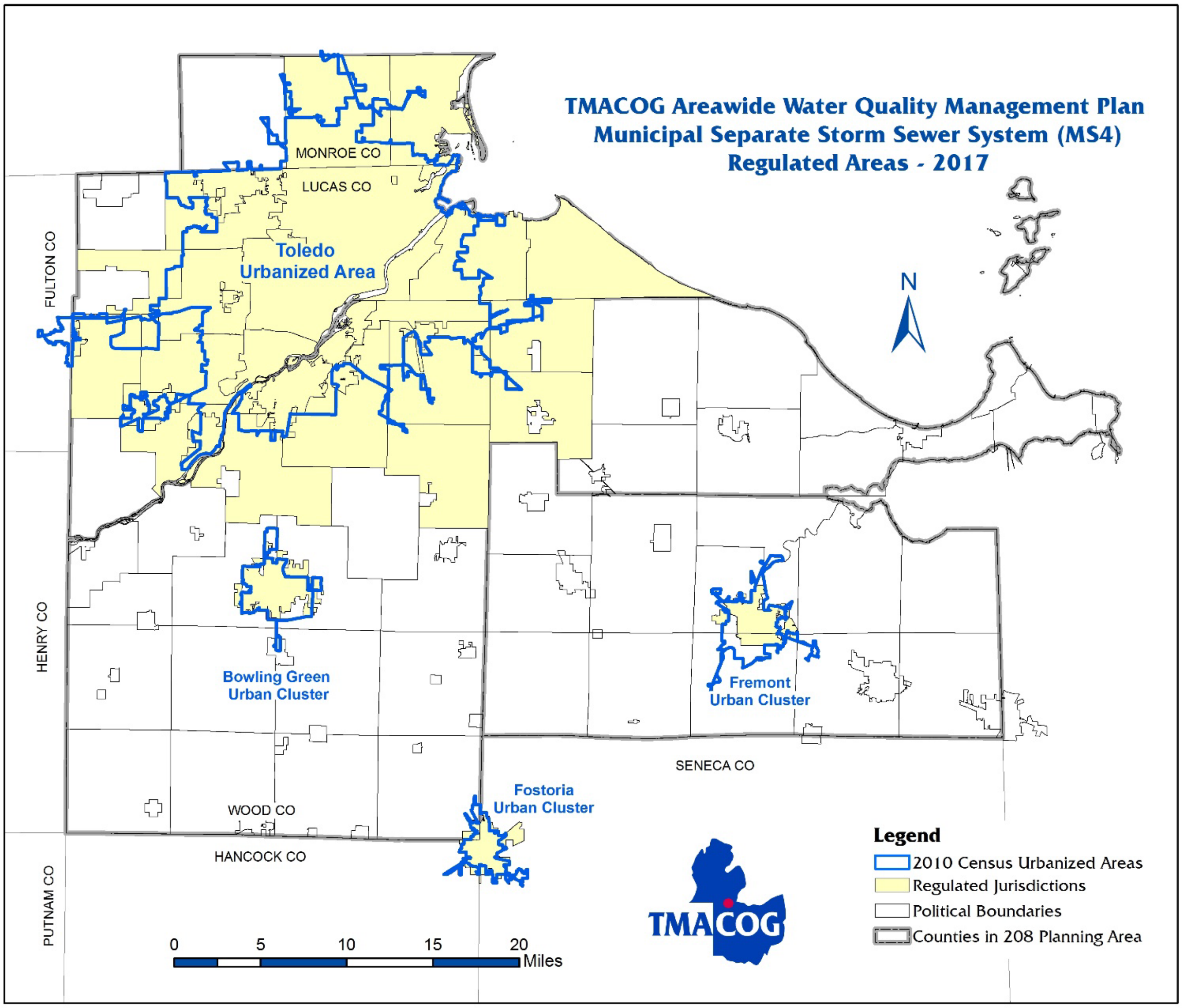

Figure 8 - 11: MS4 Jurisdictions in the TMACOG Region

VI. Stormwater Programs in Ohio and Michigan

County Governments (Ohio)

Ohio Counties must design their stormwater management programs to satisfy applicable CWA requirements by implementing programs that address the six minimum control measures listed above. Counties may construct and maintain stormwater infrastructure including "gray infrastructure" drainage facilities (i.e. storm sewers, mains, ditches) and "green infrastructure". These green stormwater practices, called "prevention and replacement facilities" in ORC Chapter 6117, include vegetated swales, permeable pavement, trees, vegetated roofs, and other practices that use or mimic natural processes to filter or reuse stormwater. Counties may enter into inter-local agreements to perform construction and maintenance functions for any municipal corporation or special district. Under the NPDES MS4 permit, counties must adopt resolutions or rules for sediment and erosion control during construction and must also establish legal authority to prohibit, detect, and eliminate illicit discharges to MS4.

Boards of County Commissioners in Ohio are authorized to construct and maintain storm sewer systems through the establishment of sewer districts, as outlined in ORC Chapter 6117. House Bill 549, signed on December 8, 2000, modified the Sewer Districts and County Sewers Law (ORC Chapter 6117) relative to the procedures for the acquisition, construction, maintenance, and operation of various facilities and other improvements and the procedures for financing improvements. Prior to the Bill, ORC 6117 only gave districts the authority to establish sanitary sewer and water utilities. HB 549 enabled legislation that explicitly gave the County Commissioners and the County Engineer the authority to establish utilities for the management and maintenance of stormwater systems.

Stormwater utilities are an innovative approach to finance and manage stormwater. A stormwater utility operates similarly to water and sewer utilities, which are financed through user fees and administered separately from the general tax fund. Among counties in the TMACOG planning area, Lucas County is the only one that uses a stormwater utility to fund storm system improvements and implement NPDES requirements. The utility is assessed on all residential, commercial, and industrial properties with discounts given to non-residential landowners for onsite stormwater treatment and green infrastructure.

Currently, the level of stormwater management program implementation varies considerably from one county to another and is done through a combination of subdivision regulations and county resolutions. The major focus of the County Engineer continues to be on drainage with an increasing emphasis on overall stormwater program management per the requirements of the NPDES permit.

Three of the four Ohio county governments in the TMACOG "208" region are identified by the NPDES Phase II Rules as operators of regulated small MS4s. As the primary permit holders of joint permits, these counties are responsible for implementing stormwater programs and practices for all townships and certain municipalities within the urbanized portions of each respective county. Under joint permits, several jurisdictions can apply for NPDES coverage under one permit. Each "co-permittee" must sign a memorandum of understanding stating the responsibilities of each jurisdiction in meeting permit requirements and the role of the County in coordinating stormwater management and planning.

County Government (Michigan)

As in Ohio, Michigan Counties must design their stormwater management programs to satisfy CWA requirements. In the TMACOG 208 area, the Monroe County Drain Commission is identified by the NPDES Phase II Rules as an operator of a small MS4. While permits were issued separately to Monroe County and selected townships, the jurisdictions tend to work together on several permit requirements, with the Monroe County Drain Commission taking a lead role.

As with any other small MS4 within an urbanized area, Michigan Counties are required to implement programs and practices to control polluted stormwater runoff. In Monroe County, the Board of Commissioners assigned the Drain Commissioner the responsibility to enforce the State of Michigan's Soil Erosion and Sedimentation Control Act. This authority does not extend to cities, villages, or charter townships that have erosion and sediment control ordinances in effect. Under provisions of the Subdivision Control Act, the County Drain Commissioner is required to review subdivision plats involving five or more parcels, to ensure that adequate stormwater facilities are included.

The County Drain Commissioner, through the Michigan Drain Code, carries out the majority of stormwater drainage improvements in Monroe County. The Drain Commissioner has responsibility for all aspects of the construction and maintenance of drainage facilities in the County and has the assessment authority to fund these projects.

Municipal and Township Governments (Ohio)

The ORC grants municipal corporations in Ohio the statutory authority to construct, own, and operate sewers, drains, and ditches for the collection and conveyance of urban stormwater runoff. They are authorized to establish drainage districts for the purpose of constructing, maintaining, repairing, cleaning, and enclosing ditches. The ORC enables municipalities to adopt ordinances or rules for urban sediment control. NPDES permittees are required to adopt ordinances that control runoff from construction sites, ensure that new and redevelopment treats and manages runoff using stormwater BMPs, require that property owners maintain BMPs, and prohibit illicit discharges into the MS4.

Municipalities possess more extensive land use powers than counties, such as zoning and subdivision control. These powers, together with their power of eminent domain, extend to the regulation of construction site runoff and other non-point source pollution. Municipalities are not bound by the Ohio Drainage Laws, and may construct and expand drainage facilities without being constrained by the petition process. In these ways, municipalities hold advantages over unincorporated areas in the control of urban runoff.

Funding mechanisms for municipal level urban stormwater management are similar to those of counties with a notable addition. Municipalities have the authority to acquire, construct, own, lease, and operate within or without its corporate limits, any public utility the product or service of which is or is to be supplied to the municipality or its inhabitants. Generally, a municipality enacts two ordinances to create a stormwater utility: one to establish the various components of the utility, and the other to determine the rate structure. Forming the utility through two separate ordinances allows the municipality to alter the rate structure without having to modify the ordinance governing the utility structure.

Municipal and Township Governments (Michigan)

Municipalities in Michigan are authorized to provide public services and make necessary improvements, including storm sewers to drain urban runoff. These entities may also administer and enforce ordinances to control erosion and sedimentation, wetlands, subdivision activity, and land use. Municipalities may elect to administer and enforce erosion and sediment control ordinances pursuant to the Soil Erosion and Sediment Control Act. The County Drain Commissioner governs all general law townships and all municipalities who choose not to administer such ordinances. Local governments are also authorized to adopt wetland protection ordinances.

Michigan municipalities may adopt subdivision control ordinances that require subdivision plats to be reviewed and approved in accordance with a stormwater management. While a drainage review is not specifically required, local governments can consider stormwater management when they review subdivision plats. Similar to Ohio, municipalities in Michigan also have broad authority to adopt zoning ordinances to regulate land use within their jurisdictions, and may require land owners to submit a site plan as part of a rezoning approval. Site plan review requirements provide a legal basis for stormwater management review of proposed developments other than subdivisions.

In the Michigan portion of the TMACOG 208 area, Bedford Township, and Erie Township are identified by the NPDES Phase II Regulations as operators of regulated small MS4s. Operators of small MS4s within urbanized areas are required to implement programs and practices to control polluted stormwater runoff, described above under stormwater NPDES permit program.

TMACOG Stormwater Coalition

The Stormwater Coalition (SWC) is a forum of regulated MS4 jurisdictions in the TMACOG region working to meet MS4 permit requirements. The group works closely with health departments, engineers, soil and water conservation districts (SWCDs), planning commissions, private sector consultants, and other groups. TMACOG staff provides direct support to members of the Stormwater Coalition through regional coordination and education and training programs that fulfill permit requirements. SWC members coordinate their stormwater programs with partners across the regions including the Toledo-Lucas County Sustainability Commission, Toledo-Lucas County Rain Garden Initiative, Partners for Clean Streams, Soil and Water Districts, and various parks districts and education partners.

VII. Stormwater Challenges and Recommendations

According to the Ohio EPA Integrated Report, about 68% of TMACOG's 208 region streams are identified as impaired for aquatic use and only about 5% are in attainment. Stormwater and urban runoff are major sources of water quality impairments in many of the regions watersheds. The beneficial use status of the watersheds in the TMACOG 208 area can be found in **Chapter 2** of this Plan. The Ohio EPA Integrated Water Quality Monitoring and Assessment Report details beneficial uses, goals, and on-going monitoring.

The following sections explain issues at the institutional level that have contributed to the stormwater problems in the TMACOG region. Many of these issues are not unique to our region as they typify problems with urbanization and land use across the nation. Each section is followed by recommended actions that stormwater managers and decision-makers can take to improve water quality in the TMACOG region.

Insufficient Watershed-Based Stormwater Planning

To control current and future stormwater runoff adequately, stormwater management should be viewed from a watershed perspective. Much of the control of stormwater occurs separately within each community through a variety of subdivision regulations and other ordinances and stormwater infrastructure is maintained separately by each jurisdiction.. However, stormwater runoff does not obey political boundaries, and several drainage systems within the region flow through more than one community.

> ***Recommended Actions: Coordinate a Regional Stormwater Planning Effort***
>
> Without some type of agreement and coordination between communities to take care of their common drainage systems jointly, there is no guarantee that the natural watershed system will work to provide adequate drainage and water quality. A regional master plan for stormwater drainage is necessary to establish the guidelines for maintaining and improving the existing

facilities, as well as providing for future development. A watershed level stormwater master plan will aid in the orderly development of new drainage facilities, water quality practices, and capital improvements. The improvements outlined in a master plan should be based on land use, proposed land use, and current land use trends in each watershed.

Each community should bring stormwater management issues into the land use planning process at the local and county planning commission level. The protection of wetlands, floodplains, and sensitive riparian corridors should be addressed in order to ensure the stormwater impacts of development are considered. Master stormwater drainage plans should be completed at the watershed level to aid in the orderly development of new stormwater facilities and capital improvements across the region.

A regional organization should be formed to build master plans and capital improvements that cover regional streams and ditch systems that serve two or more communities. A region-wide master plan should be developed based on existing jurisdictional or watershed master plans. To ensure that plans meet each watershed's water quality goals, the Ohio EPA Integrated Water Quality Report should be considered for guidance on implementing BMP based on causes and sources of impairment.

TMACOG's SWC is a group of NPDES permitted jurisdictions that have organized around a goal of collaboratively meeting NPDES permit requirements. SWC was formed through the process of planning for a regional stormwater management district. While the formation of a regional stormwater district was not successful, many elements from the original effort can be used to form a regional plan as described above.

Land Use Decisions

Past development patterns, lack of comprehensive planning, and poor land use decisions have resulted in sprawling suburban landscapes, increased costs for the construction and maintenance of infrastructure, and increased stormwater runoff and associated water quality impairments. Stormwater does not obey political boundaries, so a cross-jurisdictional, watershed-based planning philosophy is necessary. However, the planning process is complicated by the fact that responsibility for stormwater management is fragmented between several levels of government and is organized around political boundaries. Many communities have failed to regulate implement stormwater policies for development for fear of driving economic development to neighboring jurisdictions. Comprehensive land use planning at the level of each jurisdiction as well as at the regional scale is often overlooked, but is an essential element of any stormwater management program. Challenges to comprehensive watershed-based planning include lack of watershed-based stormwater management, a lack of stormwater considerations in zoning and inconsistent or inadequate standards for stormwater management across jurisdictional lines.

Recommended Action: Develop a Regional Land Use Plan

A comprehensive and collaborative land use plan is needed to prioritize areas for development, conservation, and redevelopment for the TMACOG region. Available tools such as zoning overlay districts, and conservation development should be used while providing for equitable economic development across the region. With a collaborative cross-jurisdictional approach, the region can plan development that emphasizes each community's unique sense of place and culture, while protecting and enhancing natural areas that are vital for stormwater management and water quality in our region.

Recommended Action: Update Zoning to Improve Stormwater Management

Zoning is a powerful tool in the land use planning process and is available to most communities. In many cases, however, zoning elements such as minimum lot sizes, requirements for oversized streets and parking lots, and storm sewer connection requirements have hindered the ability of communities to plan for conservation development and implement green infrastructure.

Jurisdictions in the TMACOG region should perform a review of their local codes against a checklist to ensure good storm water best management practices and green infrastructure are encouraged and allowed by local rules and regulations. Funds and technical support should be made available at state and federal levels to support local implementation of comprehensive code review

In addition, watershed conditions must be considered in land use decisions. Watershed based zoning involves defining watershed conditions, measuring current and potential future development, identifying and classifying sub-watersheds based on the amount of future development, and most importantly, modifying master plans and zoning to shift the location and density of future development to appropriate sub-watershed management categories.

Recommended Action: Plan for Conservation Development

Conservation development is an urban and suburban design technique that concentrates buildings in a compact area in one portion of a development site in exchange for providing open space elsewhere on the site. This type of design, including residential "cluster development" or mixed-use "planned unit development", can be applied to both newly developed areas and redevelopment. Minimum lot sizes, setbacks, and frontage distances are relaxed to form larger areas of open space. Conservation site designs have many benefits compared to conventional developments. They can reduce impervious cover, stormwater pollutants, construction costs, infrastructure installation and maintenance costs, grading, and the loss of natural areas. In exchange for denser development in one area, the community enjoys larger shared open spaces and natural areas. However, many barriers to conservation development exist in the TMACOG region due to dated zoning codes and misperceptions among decision-makers and residents. Many communities in the region will need to revise zoning codes to allow for conservation development to achieve greater water quality, economic, and social benefits.

The benefits of neighborhood designs that preserve open space can be amplified when combined with other site design techniques such as narrow streets and alternative turnarounds. This policy involves promoting the use of narrower streets to reduce the amount of impervious cover created by new development, and in turn, reduce the stormwater runoff and associated pollutant loads. Currently, many communities require wide residential streets that are 32, 36, and even 40 feet wide. In most residential settings, streets can be as narrow as 22 to 26 feet wide without sacrificing emergency access, on-street parking, or vehicular and pedestrian safety.

Residential street design requires a careful balancing of many competing objectives: design, speed, traffic volume, emergency access, parking, and safety, to name a few. Communities that want to change their road standards to permit narrower streets need to involve all the stakeholders who influence street design in the revision process.

Recommended Action: Provide Training

Jurisdictions in the TMACOG planning area should require developers and plan commission members to attain a yearly minimum number of training hours in the areas of regional planning and the importance of integrating stormwater planning within economic development. This will help to ensure well-informed zoning and code decisions and encourage neighborhood designs that are economically, environmentally, and socially beneficial. Local and regional planning agencies should work with homebuilder and realtor associations to develop regular training programs.

Destruction of Wetlands and Floodplains

Wetlands provide a natural way to manage and store stormwater and protect water quality. The TMACOG region has a rich heritage of extensive wetland areas. Historically, the Great Black Swamp and the closely connected Oak Openings Region were part of a vast wetland complex that reached from Fort Wayne, Indiana to Sandusky, Ohio. Today over 95% of these vast wetlands are gone, primarily a result of drainage efforts in the late 19^{th} Century and subsequent conversions to other land uses.

Most jurisdictions in the TMACOG region have programs that meet the minimum requirements of the USACE and the FEMA regarding development in wetlands and floodplains. These requirements prohibit filling large wetlands, but allow the filling of isolated wetlands and portions of the floodplain. Additional filling occurs outside of the knowledge of the regulatory agencies, through ignorance of the rules and simple negligence.

Existing federal and state laws currently protect larger, identified wetlands and floodplain areas. However, wetlands are regularly destroyed and floodplains are filled because of a lack of enforcement and inadequacy of records. Wetlands and floodplains are also negatively impacted by adjacent development on unprotected uplands.

Recommended Action: Augment Protection of Wetlands and Floodplain

A variety of options are available to protect wetlands and floodplain areas. Fee acquisition is the most recognized and permanent strategy for protection, although it is also the most expensive. Conservation easements are another option and can be effective in situations where private landowners desire to retain ownership. Easements can be purchased from landowners to protect special resource areas and an adjacent buffer, allowing for the use of the remaining land. Options for donating and conserving special resource areas should be made available to any landowner with wetlands or floodplain areas on their property. Local governments can become involved with conservation efforts by informing property owners about the conservation easement and donation options as well as the tax benefits from these options.

Recommended Action: Look for Wetlands during Site Plan Reviews

The standards local governments use to review site plans should include provisions for reviewing projects for wetland and floodplain impacts. For an example of standards that include these provisions, see the Wetlands Protection chapter of the *Stormwater Management Standards Manual* (TMACOG, 2008). Because of the importance of wetlands in stormwater management, the manual dedicates an entire chapter to natural wetlands protection. Consult the manual for more information on wetland delineation, wetland permits, and considerations for the Oak Openings region.

Recommended Action: Enforce Regulations Locally

The local floodplain administration agencies should work the local and county planning commissions, township and municipal governments and developers to enforce FEMA's floodplain regulations strictly. County, township, and municipal governments should adopt ordinances that advocate no net loss in floodplain storage volumes.

Ohio EPA and Michigan EGLE should work to expand the current protections provided wetlands through Section 404 of the Clean Water, which is administered by the USACE. Efforts should focus on fully implementing existing state and federal wetlands protection laws.

Local governments, soil and water conservation districts, and planning agencies should work to identify, describe, and document wetlands in their jurisdictions. This information should be used to develop wetland inventories and update the USACE wetland maps.

Older Developed Areas

Older, developed areas face infrastructure challenges related to sewer system capacity, maintenance, replacement, and surface runoff. At the same time, many of these areas are faced with declining tax bases, aging infrastructure, and decreasing available revenue to support water quality programs. The high-cost for construction of storage facilities to retain and treat water from combined sewer systems and the separation of sewer systems to address pollution from combined sewer overflows eliminate only the sanitary sewage portion of the urban water pollution equation.

Typically, there are limited urban runoff control practices in use in the older, built-out urban areas that were developed prior to stormwater management regulations. New site drainage design regulations most often only apply to new development and redevelopment. On existing pre-regulation sites, there are few options through the regulatory process to enforce new stormwater detention or quality requirements on these sites. Therefore, the stormwater systems in older cities must be capable of accepting this runoff volume and potential pollutants must be eliminated at their source through on-site controls and green infrastructure. Implementing stormwater controls to retrofit existing sites is more expensive and challenging from an engineering standpoint, so working these improvements into plans for infrastructure improvements, redevelopment, and demolition of obsolete sites is necessary.

Compounding runoff issues in older cities is the prevalence of abandoned industrial sites and brownfields with often undocumented, undersized, and damaged storm drainage systems. Contaminated drainage areas, pipe capacities, and runoff flow that exceed the system's capacities can release toxins into stormwater runoff and cause flooding, erosion and sedimentation.

Recommended Action: Systematically Retrofit Gray Infrastructure with Green

Older urban areas should create an inventory of prioritized sites for green infrastructure retrofits. To minimize costs, priority should be placed on sites that have plans for improvements or other grading activities. Opportunities to install onsite stormwater management exist during road, sidewalk, and other infrastructure replacement. During demolition, vacant lots should be considered for their potential role in stormwater management and flood control. A 2012 TMACOG study identified several urban sites across the Swan Creek watershed for stormwater retrofits (TMACOG, 2012). This type of analysis should be completed for the remaining urban areas in the TMACOG region.

Aging Infrastructure

Stormwater infrastructure requires regularly scheduled maintenance, routine repairs, and a set schedule to manage replacement of old infrastructure. Many municipalities struggle with funding the maintenance of aging traditional "grey" infrastructure. Expanding urban areas and increasing impervious land cover exacerbate pressures on existing stormwater systems for some municipalities.

At the same time, aging drinking water treatment facilities are facing extraordinary pressure as outdated facilities must find new ways to battle increasing water quality issues at intakes in order to provide clean, affordable drinking water across the TMACOG region. Non-point pollution from both agricultural and urban land uses combined with faulty septic systems and combined sewer overflows have been the cause of nutrient enrichment, bacterial contamination and harmful algal blooms. Upgrading water treatment plants requires that they address these water quality problems that have resulted from years of land use practices and insufficient stormwater and sanitary infrastructure that occur from the mouth all the way up to the smallest agricultural tributaries.

Recommended Action: Maintain and Upgrade Infrastructure

Based on stormwater management needs assessment, municipal, township, and county governments should develop a list of both short-term and long-term maintenance and upgrade needs of their stormwater systems. A maintenance and capital improvement schedule should be developed that outlines specific projects, responsible parties, and a priority ranking. Regular maintenance issues for existing and proposed stormwater facilities should be identified and incorporated into a stormwater facility maintenance plan for each community. A regional planning entity should identify those stormwater systems that service more than one community. Maintenance and facility upgrades should be conducted in a coordinated fashion, so that improvements compliment the efforts in neighboring communities.

Combined Sewer Overflows

The combined sanitary and storm systems of the late 19th century were designed to accelerate stormwater drainage while also transport sanitary sewage efficiently to a treatment facility. Under normal precipitation conditions the two lines run separately. However, when the systems exceed their capacity during extreme wet weather, the systems are designed to combine their flows, sending the overflow stormwater and sewage into streams without treatment. Overflow points and treatment plant bypasses are provided, by design, to prevent damage to the wastewater treatment plant and reduce local flooding during periods of high flow. Combined sewer overflows (CSOs) can be a source of long-term pollution in the receiving water, since the solids that are discharged settle to the bottom and form sludge deposits. These deposits create a continuing oxygen demand and bacterial contamination that persist during periods of dry weather.

Most communities are under U.S. EPA mandates to develop long-term control plans to reduce the number of combined sewer overflows, but upgrading existing systems requires complex engineering and extremely expensive capital improvement outlays. More detailed information on combined sewers is available in **Chapter 5** of this Plan that details Facility Planning Areas (FPAs).

Recommended Action: Supplement Long Term Control Plans

Separation and storage plans for combined sewers should be augmented with green infrastructure policies to reduce urban runoff load volumes to combined sewers. Additionally, U.S. EPA, Ohio EPA, Michigan EGLE, and the State Water Pollution Control Load Funds should increase grant funding and low-cost loans for the upgrade of sewer system and continued separation of combined sewers.

Lack of Space or Easements for System Maintenance and Improvement

Most urban sites are surrounded by existing development that limits or prohibits structural water quality control practices. Due to high building densities, these sites may present challenges to installing structural controls. Design engineers must be creative in order to gain needed flood control and deal with water quality concerns. Alternatives to traditional detention ponds or large infiltration structures must be identified. Improving or dredging drainage ditches and streams can be nearly impossible when confined to a narrow right-of-way with few access points. Obtaining additional space through easements or purchase can be politically and financially problematic. Nevertheless, unique projects with the support of property owners have been implemented in the region through the use of green stormwater infrastructure to manage and treat stormwater onsite.

Recommended Action: Retrofit with Green Infrastructure & Low Impact Development (LID)

Federal and state governments are increasingly expecting jurisdictions to build stormwater infrastructure that reduces pollution that results from urban runoff. This means integrating traditional stormwater management approaches with "green" stormwater infrastructure, which mimics natural hydrologic function and treats rainwater where it falls by encouraging infiltration, evapotranspiration, or reuse. The use of green infrastructure and low impact development combined with comprehensive neighborhood planning, and flexible zoning and building codes can provide many co-benefits including reducing urban runoff, improving water quality, and improving urban aesthetics, and increasing property values and urban livability. Unlike traditional gray infrastructure, which uses systems of curbs, gutters, and pipes to rapidly dispose of rainwater, green infrastructure uses vegetation and well-drained soils to manage rainwater where it falls. By mimicking natural hydrologic functions, green infrastructure can reduce or eliminate stormwater runoff by allowing rainwater to percolate into soils and be taken up by plants.

Examples of green stormwater infrastructure can be found on the TMACOG Green Infrastructure website, the Toledo-Lucas County Rain Garden Initiative, and the Toledo-Lucas County Sustainability Commission. For design and technical LID information as well as photographs of installed practices, the American Rivers' *Low Impact Development Manual for the Lower Maumee and Ottawa River Watersheds (American Rivers, 2010)* is a good resource.

Expansion of Urbanized Area

Development trends after World War II indicate a rapid shift in population and land development from urbanized areas to rural areas. The resulting developments offer residents larger lot sizes but also require a disproportionate amount of infrastructure to support suburban populations in areas that were once farmland and natural areas. As a result, per capita construction and long-term maintenance costs of roads, stormwater infrastructure, and other infrastructure is significantly higher. The suburbanization process, once driven by the desire for small town or rural living, has produced the sprawling suburban residential and commercial development seen throughout the TMACOG region. Suburbs across the nation and within the TMACOG region have increased the necessity for urban stormwater infrastructure, roads, and retail establishments.

As the greatest growth continues to expand the urban footprint of the TMACOG metropolitan area, the associated impervious areas and miles of stormwater pipes within TMACOG's watersheds expand at ever increasing rates. This has led to exponential increases in stormwater pollution and increases in flow velocity and stream bank erosion, the effects of which are felt by suburban and downstream communities alike (Lehner et al., 1999).

Recommended Action: Plan for Redevelopment and Restoration in the Urban Core

There are opportunities in already urbanized watersheds to focus development on previously developed sites that have been abandoned. Not only does this save on construction costs, it keeps development from encroaching on farmland, green spaces, and forest and helps to restore habitat and water quality. Areas within urbanized watersheds may be designated as Priority Development Areas (PDAs). Because they may already have been developed or use infrastructure efficiently, PDAs are ideal locations for development. Redevelopment of older city areas may offer opportunities for improving urban habitat by reducing construction in undeveloped areas or sensitive ecological habitats. Besides compliance with NPDES permits, wetland, floodplain, and habitat restoration are recommended as part of the redevelopment. Priority should be given to redevelopment with a potential for restoring riparian habitat and natural floodplains. Additionally, vacant land sites within cities should be considered for on-site green infrastructure implementation.

Recommended Action: Make Critical Urbanizing Watersheds a Priority

Jurisdictions in critical urbanizing watersheds should prioritize and focus stormwater management efforts on projects that expand, enhance, and preserve wetland, habitat, and floodwater storage. These areas should be the top priority for cost share, demonstration, and Supplemental Environmental Projects (SEP, an environmentally beneficial project to mitigate environmental law violations). These watersheds are also recommended as priority areas for TMDLs to identify sources and BMPs addressing urban nonpoint sources. To protect important natural stormwater infrastructure, jurisdictions in these watersheds should place priority on enacting ordinances and codes to focus future development on previously developed areas to protect wetlands and floodplains. In addition, the plan supports funding proposals to purchase natural habitat properties or conservation easements in these areas for the purposes of natural habitat and floodwater storage.

Recommended Action: Regulate All New development

Under the NPDES permit, all regulated MS4s must implement stormwater management programs and establish legal authority to regulate development and redevelopment. Although some communities within critical urbanizing watersheds are not under the same Ohio EPA mandates as MS4 permittees, these communities face development pressures nonetheless. Each community within the region's critical urbanizing watersheds, whether or not they are compelled by an NPDES permit, should pass ordinances governing new development and requiring utilization of stormwater BMPs.

Construction site runoff

A byproduct of urban expansion and development, construction site runoff is generated during the construction process when soil is the most vulnerable to erosion by wind and water. Studies indicate that poorly managed construction sites can release 7 to 1,000 tons of sediment per acre during a year, compared to one ton or less from undeveloped land (U.S. EPA, 1993). Suspended sediment lowers the quality of water for municipal and industrial uses as well as for boating, fishing, swimming, and other water based recreation. Deposited sediment clogs storm sewers, culverts, and drains, reduces the storage capacity of stream channels and reservoirs, fills ponds and lakes, and buries aquatic life habitat.

The construction NPDES permit requires that construction site operators control runoff leaving their site. Under the NPDES permit for MS4s, jurisdictions are responsible for reviewing site plans, inspecting sites to ensure that sediment and erosion control requirements are being met, and taking enforcement action if controls are not in place. However, programs in many jurisdictions do not meet these requirements.

Recommended Action: Enforce Construction Site Runoff Control

Jurisdictions must, under the NPDES permit, establish the legal authority to enforce construction site runoff controls. The TMACOG *Stormwater Standards Manual* provides model ordinances for establishing legal authority and guidelines for best management practices.

The ODNR *Rainwater and Land Development* manual for Ohio provides further guidance on sediments and other secondary pollutants that may be found. Recommendations are given for both temporary and permanent runoff controls.

Limited Inspection and Maintenance after Construction

Under NPDES permitting, new development and redevelopment require "post-construction" best management practices for long term runoff control and water quality protection. Lists of BMPs and design specifications can be found in the TMACOG *Stormwater Standards Manual* and the ODNR *Rain Water and Land Development Manual*.

Within the TMACOG region several jurisdictions utilize design standards for stormwater management.

The cities of Toledo, Oregon, Maumee, and Sylvania have and enforce their own standards. The Lucas and Wood County Engineers' offices have developed and enforce design standards for development that occurs in the unincorporated areas of their respective counties. However, standards and the site plan review process is not consistent across jurisdictions.

Effective runoff management using structural practices requires successful execution of all phases of development. This includes a thorough site plan review, inspection to ensure proper construction, and committed resources for long-term operation and maintenance after these facilities are constructed. Most areas of the TMACOG region have some level of site plan review and require a permit or other type of approval prior to construction. However, limited resources and training have resulted in inadequate review and inspection in many cases.

The expense of maintaining most stormwater infrastructure is relatively small compared to original construction costs. However, maintenance is often not completed, particularly when facilities are privately owned. Inadequate maintenance decreases the efficiency of the stormwater management facilities, and may also detract from the aesthetic qualities of some practices. In addition, jurisdictions struggle with the logistical and legal challenges of requiring and enforcing long-term maintenance agreements with private property developers and land-owners.

Recommended Action: Set Clear Regional Standards

To meet NPDES permit requirements and to ensure uniformity in standards across jurisdictions in the TMACOG region, political jurisdictions in urbanized areas are recommended to adopt and implement the policies and practices detailed in the TMACOG *Stormwater Management Standards Manual.* All stakeholders — local governments, developers, construction contractors, industries, and citizens — need clear statements of what is expected of them and need to be held to an acceptable performance level. Local governments should facilitate this by setting clear standards, creating incentives, conducting routine monitoring and strongly enforcing laws and regulations.

Municipal, township and county governments are required by the NPDES permit to pass or update ordinances that establish design guidelines for new facilities and require regular maintenance activities for existing facilities. Regional design, construction, and maintenance standards for post-construction BMPs should be agreed upon and implemented to create consistency across jurisdictions. Long- or short-term funding options for inspection, enforcement, and maintenance should be explored.

Recommended Action: Implement Long-term Maintenance Agreements

Clearly defined operation and maintenance requirements within a stormwater ordinance can ensure that initial designs facilitate easy maintenance and that regular maintenance activities are completed. Long-term maintenance agreements with homeowners' associations or other private entities must be implemented for stormwater management practices on privately owned land. *The Stormwater Standards Manual* provides a model ordinance that, once adopted, gives jurisdictions the authority to regulate and enforce standards and long-term maintenance agreements.

Funding and Program Management

Implementing effective stormwater management programs does cost money, but traditional government funding sources do not address the unique nature and growing problem of stormwater runoff. Many of TMACOG's jurisdictions do not have the funding sources or expertise to administer a comprehensive program required under the expanding NPDES stormwater rules, nor do they have a reliable funding source devoted to operation, maintenance, or capital costs of their stormwater system. Community leaders are reluctant to allocate adequate funds for stormwater pollution control, because the money comes from the same pool as more popular programs. In addition to local funding hurdles, low interest loans from federal and state revolving loan funds are designed to fund capital projects and are not applicable for many of the non-capital aspects of a stormwater pollution program. Local governments should choose and implement an appropriate stormwater financing mechanism(s) based on documented needs, sound financial planning, input from their constituents and consultation with adjacent or overlapping governmental entities.

Recommended action: Identify Needs

Municipal, township and county governments should identify and document stormwater management and drainage needs. This should include a thorough assessment of water quality issues and their relationship to urban runoff and stormwater management in their jurisdiction. Stormwater Management Plans should set goals for meeting each of the NPDES minimum control measure and TMDL waste load allocations. An annual budget should be developed that addresses documented needs and provides for planning and study of future needs.

Recommended action: Develop Reliable Stormwater Funding Sources

A dedicated source of revenue should be developed to provide adequate programming and maintain program continuity. Some local governments have funded stormwater management measures through charging inspection and permit fees, taxing new development at an increased rate, forming regional stormwater management districts, and creating stormwater utilities. Research has shown that the most effective programs have been the stormwater management districts and stormwater utilities that operate similarly to water and sewer programs, and are funded through service fees that are administered separately from the general tax fund. However, stormwater utilities can be politically challenging as stormwater rate payers are asked to pay to prevent flooding and water pollution problems, which are not always perceived as necessary. An EPA study identified three major advantages of stormwater district or utilities over funds generated through property tax revenues (Doll et al., 1998):

- Increased stability and predictability
- Greater equity
- The opportunity for incorporating incentives for implementation of on-site stormwater management.

The City of Toledo established a stormwater utility in 2000 to fund long neglected planning, maintenance and capital improvement of their system. Similarly, Lucas County implemented a stormwater utility in 2011 to serve its unincorporated areas. Unincorporated areas, under Ohio law, do not have the option of forming stormwater utilities. A utility may be formed to serve unincorporated areas by the County Commissioners per ORC §6117 as described earlier in this chapter or through a Regional Water and Sewer District per ORC §6119.

Recommended action: Take advantage of State and Federal Funding

Although grants to address water pollution from the federal government have become more competitive, jurisdictions should take advantage of the state and federal funding mechanisms that do exist. These include support in the way of grants, loans, and technical assistance to support long range stormwater infrastructure planning and green stormwater infrastructure demonstration projects. Programs that may be available to provide planning and implementation funds include:

- Ohio Public Works Commission (OPWC): Issue 2 Local Public Infrastructure Financing Program
- Ohio Department of Development (ODOD): Ohio Water and Sewer Commission Rotary Loan Program, Community Development Block Grant Program
- Ohio EPA Division of Environmental and Financial Assistance (DEFA): Water Pollution Control Loan Fund
- U.S. EPA / Ohio EPA / Michigan EGLE: Clean Water Act §319 Non-Point Source Grants
- U.S. EPA Great Lake Restoration Initiative
- ODNR / Michigan EGLE: Coastal Management Program

Recommended action: Gain Citizen Support of Stormwater Funding

To gain citizen support of stormwater management funding, jurisdictions should prioritize education efforts that communicate the necessity of well-maintained and sustainable stormwater infrastructure and its role in flood prevention and water quality protection. The County SWCDs, TMACOG, Partners for Clean Streams, the Portage River Basin Council, and the Sandusky River Watershed Coalition should assist jurisdictions with information and education programs. To fund educational programs, these organizations should form regional partnerships to apply for competitive grant funding through programs such as the Ohio Environmental Education Fund, the Lake Erie Protection Fund, and the Coastal Zone Management Assistance program.

Recommended action: Provide Federal and State Support

U.S. EPA should continue to provide and expand technical and financial support to the state agencies responsible for implementing the NPDES program. Additionally, financial assistance to the local MS4 permit holders is needed to assist in meeting public education, mapping, inspection, operations and maintenance, and enforcement requirements of the permits. Additionally, U.S. EPA should increase funding to existing loan and grant assistance programs targeted at upgrading municipal stormwater infrastructure with green infrastructure retrofits.

Ohio EPA and Michigan EGLE should provide technical assistance and guidance to local governments on stormwater regulatory requirements. Grant assistance should be provided to local governments and planning agencies to develop stormwater management plans and financing mechanisms.

Water Quality – Regulation Disconnect

While the goal of the Ohio EPA MS4 stormwater program is to fulfil the requirements of the Clean Water Act for municipal stormwater discharges, the state has not implemented regulatory authority to enforce water quality standards set through the TMDL program. Strict enforcement of end of pipe pollutant loads is not an appropriate approach for regulating urban runoff and doing so would create a tremendous burden for municipalities and regulatory agencies alike. On the other hand, the primary tool for regulating stormwater runoff is not being fully utilized. The NPDES permit for small MS4s does not enforce measures that will meet waste load allocations for MS4s and have a measurable impact on water quality. If MS4s are to integrate stormwater programs with water quality goals, coordination between regulators and permit holders is necessary.

Recommended Actions: Develop Rules Acceptable to Stakeholders

U.S. EPA, Ohio EPA, and Michigan EGLE must reach agreement to establish TMDLs expeditiously and a plan for implementation within the framework of the NPDES MS4 permit. During each step of the TMDL process, Ohio EPA should work within existing public input and participation processes and with local watershed groups, other state and local agencies, local elected officials, and the public to ensure a program is practicable and implementable. Scientifically defensible implementation schedules for MS4s should be set through cooperative partnerships between state permitting authorities and MS4s or their appointed representatives. A well-coordinated enforcement program will include specific waste load allocations for jurisdictions, generous timelines, and flexibility in meeting load reduction goals.

Recommended Actions: Provide Support for Implementation

Regulatory agencies should provide clear guidance on appropriate BMPs to meet these goals with a focus on green infrastructure practices. State permitting authorities should provide technical guidance to MS4s to meet these new requirements. At the federal level, non-competitive funds and technical support should be made available to regulated MS4s to meet TMDL reduction requirements.

Recommended Actions: Support Green Infrastructure

Because green infrastructure offers more water quality benefits than traditional stormwater infrastructure and because these techniques are often more cost-effective long term than traditional techniques, state regulatory agencies should provide MS4s with all necessary resources to meet waste load allocations using green infrastructure. The U.S. EPA recognizes the multiple benefits of managing storm water on-site using these practices and strongly supports incorporation of these techniques into NPDES permits. State and federal regulatory agencies can support MS4s by providing quantitative credits and incentives for green infrastructure installation.

Recommended Actions: Leverage Resources from Other Programs

Ohio EPA and Michigan EGLE should work through the Coastal Non-point Pollution Control Program to further encourage the adoption of stormwater BMPs in sensitive coastal areas. Local, regional and state management agencies should work toward full implementation of the urban areas management measures outlined in Chapter 5 of the Ohio Coastal Non-point Pollution Control Program Plan and the Michigan Coastal Non-point Pollution Control Program Plan.

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CHAPTER 9: PUBLIC DRINKING WATER

I. Overview of public drinking water systems

Communities in Ohio began filtering and providing public water in the early 19th century. Through expansions in utility services, and advancements in filtration and treatment technologies, the number of people with access to safe and reliable drinking water has expanded tremendously. Today, many communities and regional water utilities are responsible for providing safe, reliable drinking water to their residents and customers.

The Ohio Environmental Protection Agency (OEPA) defines a public water system as any system that provides water for human consumption to at least 15 service connections or serves an average of at least 25 people for a minimum of 60-days in a year. These systems range in size from large municipalities to smaller privately-owned establishments. Public water systems are required to monitor their water regularly for contaminants.

Public water systems are classified according to the number of people they serve in a year:

- Community water systems serve at least 15 service connections used by year-round residents or regularly serve at least 25 year-round residents. Examples include cities, mobile home parks, and nursing homes.
- Non-transient, non-community systems serve at least 25 of the same people over six months per year. Examples include schools, hospitals, and factories.
- Transient non-community systems serve at least 25 different people over 60 days per year. Examples include campgrounds, restaurants, and gas stations. In addition, drinking water systems associated with agricultural migrant labor camps, as defined by the Ohio Department of Agriculture, are regulated even though they may not meet the minimum number of people or service connections.

In contrast to Public Water systems, private water systems are households and small businesses that serve fewer than 25 people per 60 days in a year (e.g., small bed and breakfasts, small day cares and small churches). Private water systems are regulated by the local health departments in both Ohio and Michigan.

Public Water Systems (PWSs) are protected by the Safe Drinking Water Act (SDWA), which includes source water protection, treatment, distribution system integrity, and public information. These approaches help to provide safe and reliable water through four key steps:

- Risk Prevention: Selecting and protecting the best source of water where possible and protecting the current source of water.
- Risk Management: Using effective treatment technologies, properly designed and constructed facilities, and employing trained and certified operators to properly run system components.

- Monitoring and Compliance: Detecting and fixing problems in the source water and distribution system.
- Individual Action: Providing customers with information on water quality and health effects so they are better informed about their water system.

The goal of drinking water treatment is to ensure that the water meets health-based standards set by the U.S. Environmental Protection Agency (U.S EPA) and state regulatory agencies, and to protect public health by preventing waterborne diseases and exposure to harmful substances.

Importance of safe and reliable drinking water

The importance of clean drinking water cannot be overstated, as it directly impacts all aspects of life and well-being. Water needs to be clean, free of disease, metals, human and animal waste, and needs to be affordable for everyone. According to a World Health Organization (2023) report, safe and reliable drinking water is important for public health, whether it is used for drinking, domestic use, food production or recreational purposes. Improved water supply and sanitation, and better management of water resources, can boost economic growth and contribute to poverty reduction (World Health Organization, 2023). Sufficient water treatment facilities and good hygiene are key measures to prevent health complications, particularly in vulnerable populations such as those with chronic health conditions. People with certain chronic medical conditions, compromised immune systems, respiratory diseases, children, and elderly people, can be more at risk of having severe effects from a water-related illness. Access to clean and safe drinking water is a cornerstone of public health. One event that demonstrates the devastating consequences of compromised water quality is the Flint water crisis in Michigan where compromised pipes caused lead exposure that resulted in negative public health impacts. Another example is the 2014 toxic algal bloom in Lake Erie that disrupted water service for over 500,000 people in northwest Ohio. While no one was directly exposed to the toxic algae in their drinking water, water service was discontinued for three days. Contaminants such as lead, per- and polyfluoroalkyl substances (PFAS), nitrates, and microcystin found in harmful algae blooms pose significant risks to human health.

Flint's 2014 water crisis exposed thousands of residents, especially children, to elevated blood lead levels and associated developmental risks, deepening environmental challenges and eroding public trust in government institutions (Hanna-Attisha et al., 2016; Pulido, 2016). The lead-contaminated water that residents were exposed to resulted in an increased risk of hypertension for pregnant women and may have interfered with their choice of whether to breastfeed. Moreover, the health effects of lead exposure in children increased the risk of impaired cognition, behavioral disorders, hearing problems, and delayed puberty. Analyzing health records from 2008 to 2015, researchers found that fertility rates in Flint dropped by 12 percent, and fetal deaths rose by 58 percent. a Additionally, babies who were born full-term in Flint during the water crisis had lower birth weights. The magnitude and long-term health consequences of the Flint crisis, particularly for low-income and marginalized communities, were severe.

The three-day "Do Not Drink" advisory in Toledo event revealed vulnerabilities in water safety monitoring and infrastructure resilience. Despite substantial improvements at the Toledo Water Treatment Plant since the 2014 microcystin event, many Toledo residents remain wary of the public water system due to the initial crisis and its perceived mishandling (Hope & Glauser, 2015; McElmurry et al., 2016). Ensuring reliable drinking water systems is essential not only to reduce the incidence of waterborne diseases but also to protect vulnerable populations and restore public confidence, ultimately enhancing overall community health.

II. Drinking Water Regulatory Frameworks

I. Federal Public Drinking Water Regulations

The Safe Drinking Water Act (SDWA) was enacted by the U.S. Congress in 1974 to protect the quality of drinking water in the U.S. It mandates the U.S. EPA to develop national standards and establish requirements for public water systems concerning treatment, monitoring, and reporting. Its overall goal is to protect public health by setting enforceable standards for specific contaminants in rivers, lakes, reservoirs, springs, and groundwater wells. The SDWA also sets the requirements for treating the contaminants detected in drinking water. For this purpose, it mandates all utilities to assess their water sources regularly. To implement it successfully, the U.S. EPA is empowered to establish and enforce national health-based standards to protect drinking water from both naturally occurring and human-caused contaminants.

II. Statewide Public Drinking Water Regulations

In accordance with the federal SDWA, both Ohio and Michigan have developed robust public drinking water programs that meet federal requirements. Each state administers these programs through their respective regulatory agencies to ensure safe and reliable drinking water for residents, businesses, and institutions. Ohio regulates public drinking water primarily through the Ohio Administrative Code (OAC) 3745-81, which aligns with the federal SDWA and sets comprehensive standards for water quality monitoring and reporting. The OAC establishes maximum contaminant levels (MCLs) for a wide range of pollutants and mandates regular water sampling, laboratory analysis, and prompt public notification if standards are exceeded. These rules apply to both community and non-community water systems, supporting a consistent, statewide approach to drinking water protection. Oversight is managed by the OEPA through its Division of Drinking and Ground Waters (DDAGW), which enforces regulations, certifies water system operators, and provides technical and financial assistance, such as the Drinking Water Assistance Fund, to help communities maintain compliance and improve infrastructure. Michigan's drinking water program is administered by the Department of Environment, Great Lakes, and Energy (EGLE), under the authority of the Michigan SDWA. The state's regulatory framework is codified in the Michigan Administrative Code (Rules R 325.10101 to R 325.12820), which, like Ohio's, sets MCLs, requires routine monitoring, and emphasizes operator certification and reporting. Michigan regulates approximately 1,400 community and 9,500 non-community systems. Its Drinking Water and Environmental Health Division (DWEHD) also supports functions such as source water protection, well construction oversight, and coordination with local health departments.

Both Michigan and Ohio have taken significant steps to tackle water quality issues posed by emerging contaminants. In Michigan, the Flint water quality crisis spurred the state into action, leading to stricter rules for lead and copper in drinking water. These changes include replacing service lines and educating the public to prevent similar situations. Ohio, on the other hand, aligns its lead and copper standards with federal requirements and is working to map and replace lead service lines throughout the state. Currently, both states are addressing issues about PFAS chemicals in drinking water. As of 2025, Michigan has set enforceable MCLs for seven PFAS compounds, while Ohio has set action levels for six compounds based in the 2024 federal MCLs. Ohio's PFAS MCLs, reflective of the federal standards, are expected to be final in 2027. Both Ohio and Michigan programs include PFAS sampling requirements guidance to help water systems navigate this issue. In terms of funding, both states offer financial assistance to communities for infrastructure improvements. Ohio's Drinking Water Assistance Fund and Michigan's MI Clean Water Plan both provide grants and low-interest loans to support system upgrades and long-term compliance.

Ohio and Michigan maintain comprehensive and federally compliant drinking water programs; each tailored to their state-specific needs and experiences. While individual policy emphases may differ, such as Michigan's lead response or Ohio's statewide technical assistance network, both programs are grounded in a shared commitment to protecting public health and ensuring high-quality drinking water.

III. Source Water Assessment and Protection

The 1974 SDWA sets enforceable standards for specific contaminants and requires that drinking water be treated. The SDWA also aims to prevent contamination of the drinking water source prior to treatment and requires utilities to assess their source of water. Ohio EPA and Michigan EGLE are charged with ensuring that public water supplies comply with the SDWA and evaluate potential threats to source waters. While the CWA and SDWA can work in tandem to protect drinking water sources, regulatory gaps present challenges to local governments charged with providing safe drinking water. Ohio's Source Water Assessment and Protection (SWAP) program, also known as Drinking Water Source Protection or "Wellhead" Protection, focuses on protecting the state's public water systems from contamination. While public systems treat water to meet health-based standards, preventive measures to avoid chemical spills near well fields or surface water intakes are crucial. These actions help communities reduce treatment costs and ensure safe, high-quality drinking water. Public water suppliers drawing from the western basin of Lake Erie face the unique challenges presented by seasonal algal toxins that emerge each year.

Michigan's source water protection program is formulated to protect water sources for local communities that use groundwater and surface water for their municipal drinking water supply systems. This includes management strategies to reduce contamination risk, contingency and new source planning, and public education and outreach. Michigan EGLE's source water protection program includes identification of areas where groundwater is used to supply drinking water to communities.

While source water protection plans offer a planning tool to leverage governmental and private investment to protect source water, public water systems lack the authority to control nutrients and other pollutants that impact their source of water outside of their own political boundaries.

IV. Emerging Issues

High demand for available water resources, along with pollution of groundwater and surface water resources, has led to water quality issues in recent years. Expansion of tech industries activities such as the construction of data centers in rural areas, and an increase in industrial livestock farming in the region have led to evolving water quality and availability challenges in Ohio and Michigan. In recent years, extreme weather events have exacerbated the issue as some of the facilities available to treat polluted water are older and may struggle to handle the challenges of these weather events.

A report from the Environmental Working Group identifies high levels of more than 100 contaminants like disinfectant byproducts, nitrates and forever chemicals called PFAS in Ohio's drinking water. As a result, Ohio and Michigan have recently accelerated efforts to address issues such as lead pipes and PFAS contamination. In October 2024, the Biden administration announced $56.2 million in funding to support Ohio's lead pipe replacement initiative, following the U.S. EPA's mandate to remove lead service lines. Meanwhile, Michigan has led efforts to regulate PFAS, establishing state-level maximum contaminant levels to safeguard public health. Beyond PFAS, emerging contaminants, including pharmaceuticals, personal care products, microplastics, and industrial chemicals are increasingly being detected in water supplies. These substances, which are not yet fully regulated, present complex challenges to drinking water systems due to limited treatment technologies and evolving health risk assessments. Compounding these issues is a nationwide shortage of qualified water treatment operators and technical staff, threatening the continuity and resilience of safe water delivery. In response, TMACOG has started a water workforce training program to train more operators and increase the number of operators for the water treatment facilities in the region.

V. Public Drinking Water Infrastructure

i. Drinking Water Treatment Plants

Drinking water treatment involves the process of removing contaminants and impurities from raw water sources to produce safe and potable water for human consumption. The process begins with coagulation and flocculation, where chemicals are added to clump particles together into larger masses, which then settle out in the sedimentation phase. Filtration follows, using materials like sand, gravel, or activated carbon to remove smaller particles, bacteria, and protozoa. Disinfection is the final critical step, where chlorine, chloramine, ozone, or ultraviolet light are used to kill any remaining pathogens. Advanced treatment technologies like activated carbon adsorption, ion exchange, and reverse osmosis may also be used to address specific contaminants (Figure 9-1).

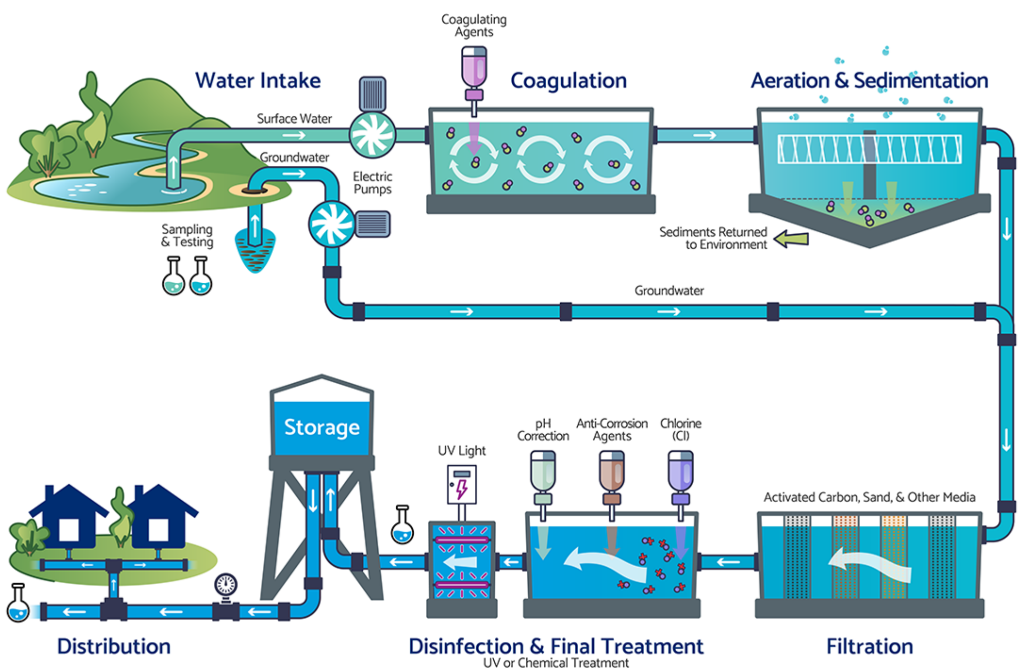

Figure 9 - 1: Drinking Water Treatment Process.
Source: Community Utilities of Pennsylvania

ii. Drinking Water Treatment Facilities in TMACOG 208 Planning Area

There are nineteen (19) Drinking Water Treatment Facilities in the TMACOG 208 planning region which serves a population of nearly 600,000 (Figure 9-2). The water treatment facilities in the TMACOG region receive their water from several types of sources. Most of the region's drinking water is sourced from Lake Erie, while several other facilities utilize intakes in nearby rivers or creeks to feed reservoirs. Some facilities utilize ground water wells as their permanent source and as an emergency source. The largest plant in the region is Toledo Collins Park Water Treatment Plant (WTP) in Lucas County, serving approximately 80% of the public drinking water in the region. The smallest plant in the region is in Whiteford Township in Monroe County, Michigan. The Whiteford Township WTP began running in 2018 to deliver drinking water to the surrounding residences and businesses and is planning to expand the service area to meet the township's demands.

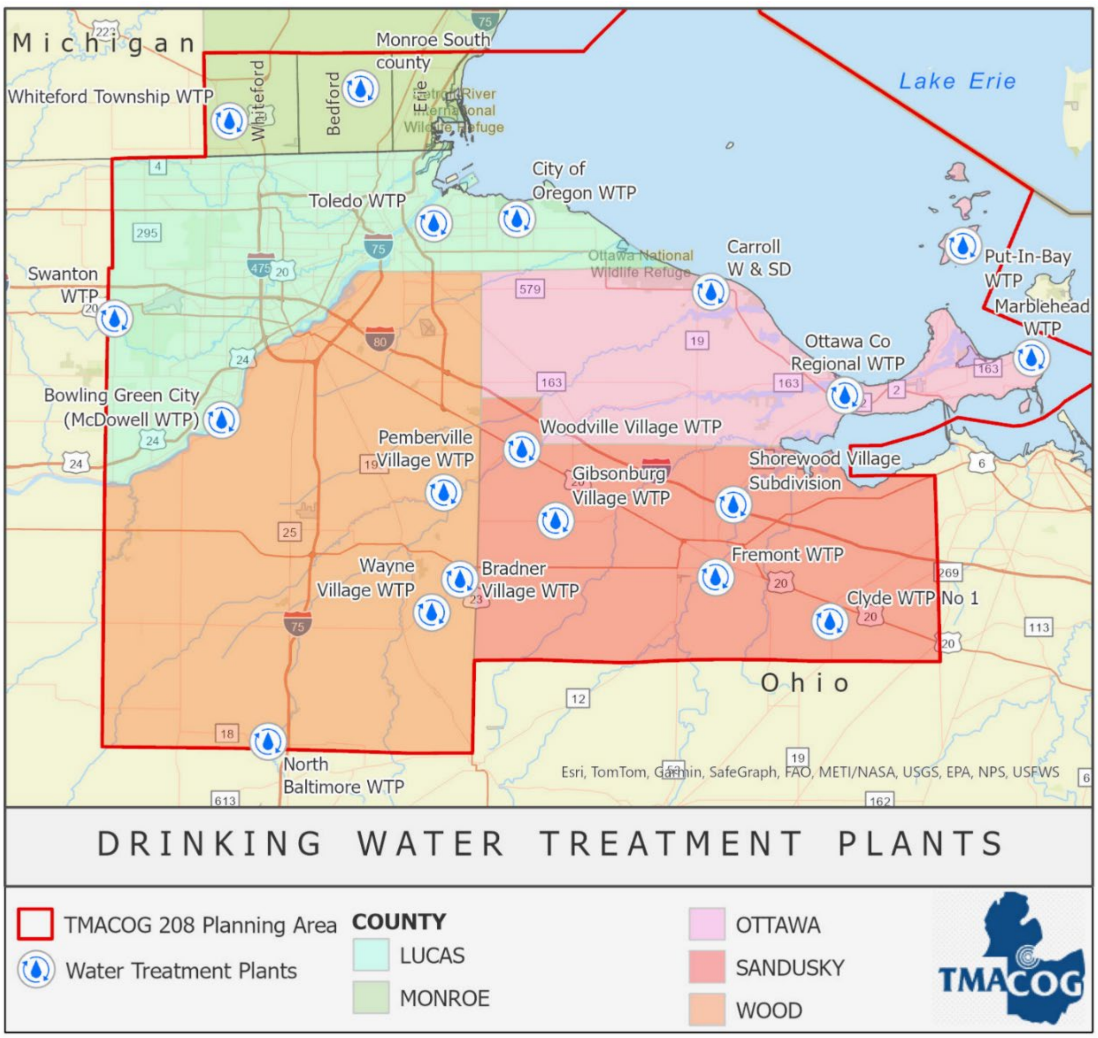

Figure 9 - 2: Water Treatment Plants in TMACOG 208 Planning Region

a. Lucas County Water Treatment

Three drinking water treatment plants serve Lucas County residents including the City of Toledo WTP, City of Oregon WTP, and Swanton WTP (Figure 9-3).

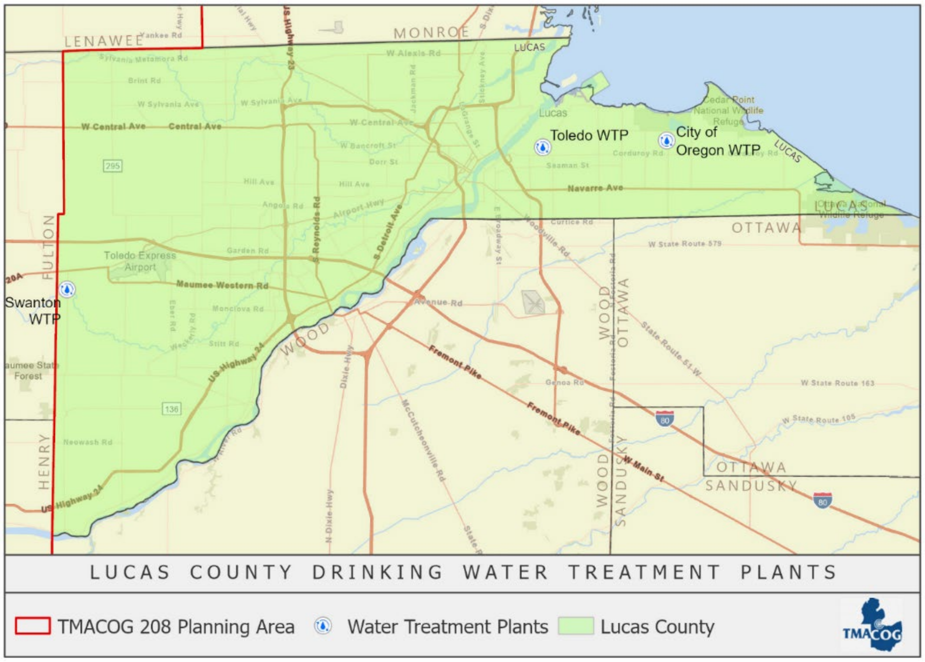

Figure 9 - 3: Water Treatment Plants in Lucas County

Table 9 - 1: Summary of Lucas County Drinking Water Treatment Facilities

Facility Name	**Toledo WTP**
Age of System	1942
Latest Major Upgrade (Year)	NA
Average-day production	65 MGD
Source water	Intake from: Toledo City Lake Erie Intake
Population served	480,000
Communities Served	Lucas County, Fulton County, City of Oregon, Toledo Refining Company along with the City of Oregon, City of Maumee, South County Water Dist. Of Monroe County, City of Perrysburg, City of Sylvania, NWRWSD (Wood County), and The Village of Whitehouse.
Facility Name	**City of Oregon WTP**
Age of System	1964
Latest Major Upgrade (Year)	2004
Average-day production	10MGD
Source water	Intake: Lake Erie, Toledo Otter CR, Emergency DS Connection
Population served	19,950
Communities Served	City of Oregon, City of Northwood, Lake Township (Wood County), Jerusalem Township (Lucas County), Village of Genoa (Ottawa County), Village of Millbury (Wood County), and the Village of Harborview (Lucas County).
Facility Name	**Swanton WTP**
Age of System	1974
Latest Major Upgrade (Year)	NA
Average-day production	0.335 MGD

Source water	Intake Reservoir, Intake Swan Creek Reservoir, Well 1, Swan Creek Water, District 2 Emergency
Population served	3,855
Communities Served	Swanton

b. Ottawa County Water Treatment

Four drinking water treatment plants serve the population of Ottawa County. These are: Carroll Water and Sanitary District (W&SD), Ottawa County Regional WTP, and Put-In-Bay WTP (Figure 9-4).

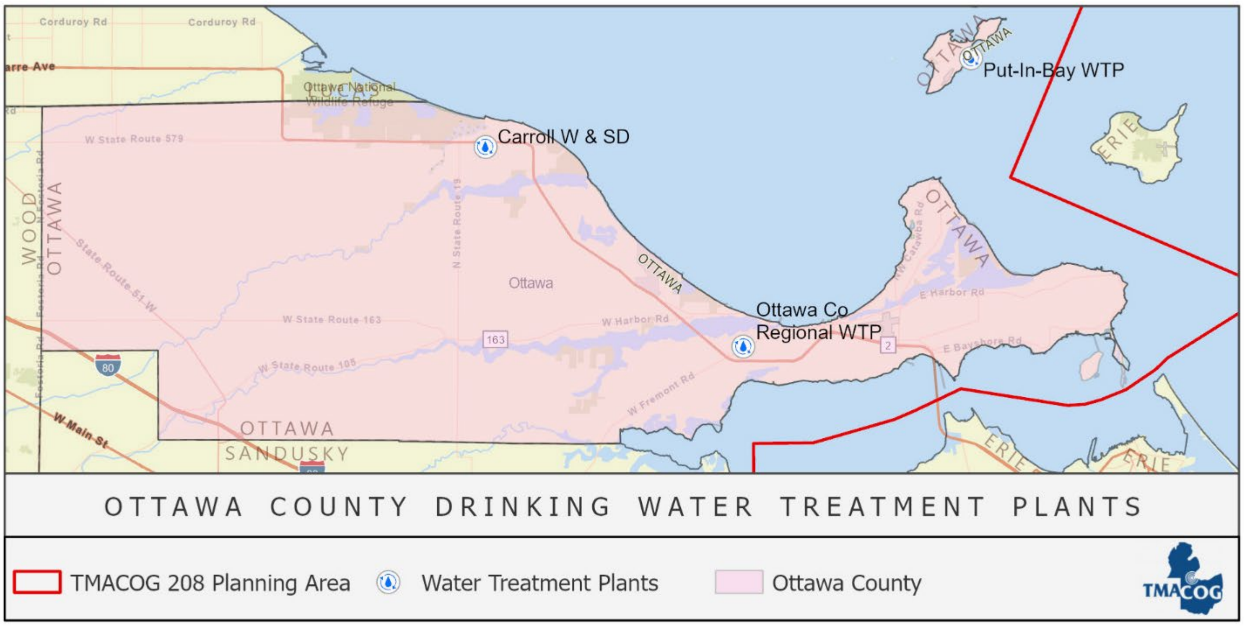

Figure 9 - 4: Water Treatment Plants in Ottawa County

Table 9 - 2: Summary of Ottawa County Drinking Water Treatment Facilities

Facility Name	**Ottawa Co Regional WTP**
Age of System	1999
Latest Major Upgrade (Year)	2005
Average-day production	3.637MGD
Source water	Intake Lake Erie, Intake from Emergency Portage River
Population served	19,556
Communities Served	Ottawa
Facility Name	**Carroll W&SD**
Age of System	1998
Latest Major Upgrade (Year)	NA
Average-day production	0.40MGD
Source water	Intake Lake Erie, CC Ottawa Regional Emergency Connection
Population served	2,288
Communities Served	Carroll Township
Facility Name	**Put-In-Bay WTP**

Age of System	1974
Latest Major Upgrade (Year)	NA
Average-day production	0.32MGD
Source water	Intake from Lake Erie
Population served	700
Communities Served	Put-In-Bay Township

c. Sandusky County Water Treatment

Sandusky County currently has five water treatment plants. These are Fremont WTP, Clyde WTP No 1, Gibsonburg Village WTP, Woodville Village WTP, and Shorewood Village Subdivision WTP (Figure 9-5).

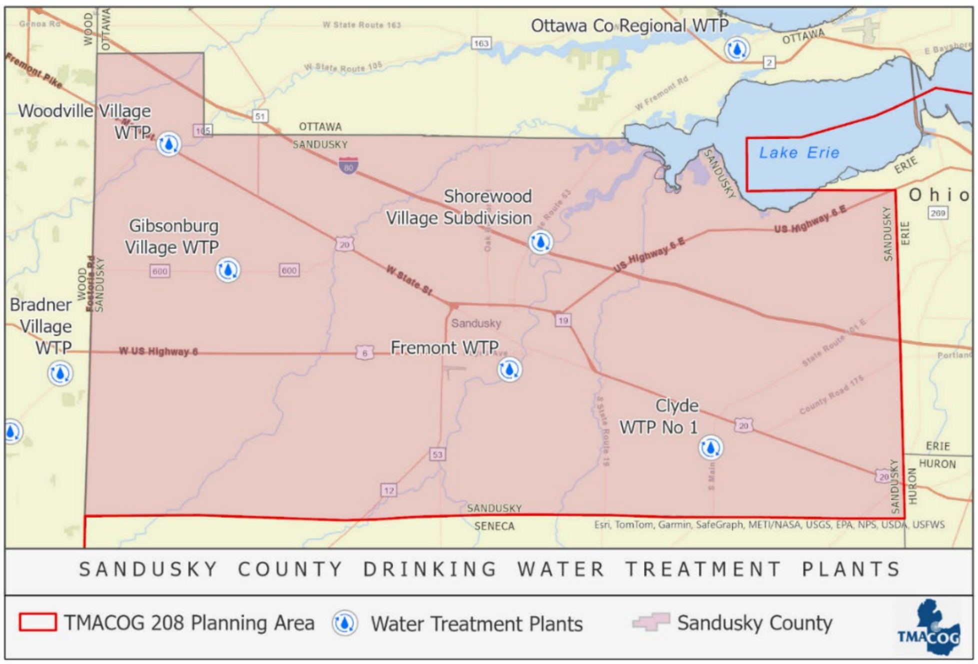

Figure 9 - 5: Water Treatment Plants in Sandusky County

Table 9 - 3: Summary of Sandusky County Drinking Water Treatment Facilities

Facility Name	**Fremont City**
Age of System	1974
Latest Major Upgrade (Year)	NA
Average-day production	6.0 MGD
Source water	Intake Reservoir, Intake Sandusky River, Reservoir, Ballville Dam
Population served	18,319
Communities Served	City of Fremont
Facility Name	**Clyde WTP No. 1**
Age of System	1997
Latest Major Upgrade (Year)	NA
Average-day production	1.25 MGD
Source water	Intake Beaver Creek, Intake Beaver Creek Reservoir, Intake Racoon Creek Reservoir, Beaver Creek Reservoir, Racoon Creek Reservoir

Population served	6,325
Communities Served	Clyde Township
Facility Name	**Gibsonburg Village**
Age of System	2001
Latest Major Upgrade (Year)	2001
Average-day production	0.31 MGD
Source water	Well 3, Well 4, Well 5, Well 6, Well 7
Population served	2,506
Communities Served	Gibsonburg community
Facility Name	**Woodville Village**
Age of System	1974
Latest Major Upgrade	Upgrades in March 2020, Phase III Waterline Replacement Project in Fall 2024, Water Tower Replacement 2025-2026, Water St. Waterline Replacement Fall 2025.
Average-day production	0.170 MGD
Source water	Well 2, Well 5, Well 6, Well 7, Well 8, Well 9, Well 10, Well 11
Population served	2,006
Communities Served	Woodville and a few Woodville Township residents
Facility Name	**Shorewood Village Subdivision**
Age of System	1971
Latest Major Upgrade (Year)	NA
Average-day production	0.015 MGD
Source water	Well 1, Well 2
Population served	359
Communities Served	Village of Shorewood

d. Wood County Water Treatment

Five drinking water treatment plants serve Wood County residents: McDowell WTP (Bowling Green), Bradner WTP, North Baltimore WTP, Pemberville Village WTP, and Wayne Village WTP (Figure 9-6).

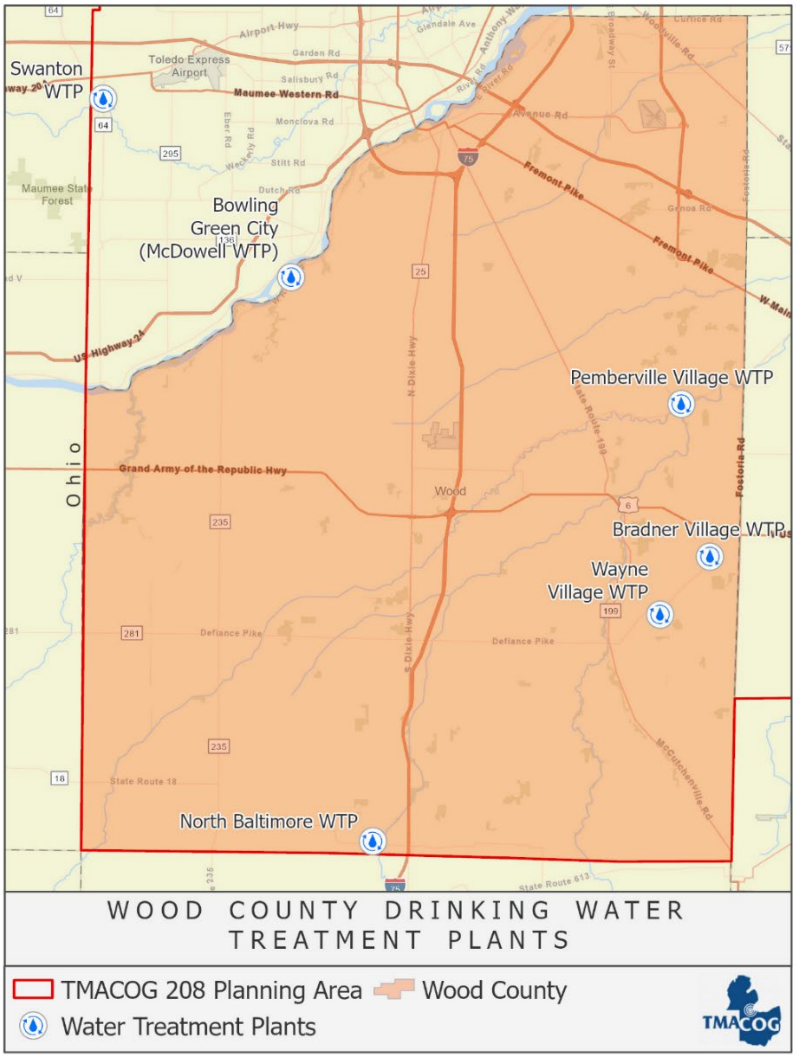

Figure 9 - 6: Water Treatment Plants in Wood County

Table 9 - 4: Summary of Wood County Drinking Water Treatment Facilities

Facility Name	**Bowling Green City (McDowell WTP)**
Age of System	1951
Latest Major Upgrade (Year)	2024
Average-day production	4.767 MGD
Source water	Intake 1 Maumee River, Intake 1 Reservoir, Intake 2 Maumee River, Intake 2 Reservoir, Reservoir
Population served	31,578
Communities Served	Bowling Green, Northwest Water, Waterville, Grand Rapids, Tontogany
Facility Name	**North Baltimore WTP**
Age of System	1970
Latest Major Upgrade (Year)	Most recent major upgrade-1998 In 2015 TTHM removal was added to the clear wells In 2022-2023 a new 500,000 gallons water tower and water main was added In 2023-2024 water mains were replaced and a loop under interstate I75 was added

Average-day production	0.680 MGD
Source water	Intake Reservoir 1, Intake Reservoir 2, Intake Rocky Ford 2, Reservoir 1, Reservoir 2
Population served	3,432
Communities Served	Also serves the Village of McComb via Northwest water district
Facility Name	**Pemberville Village**
Age of System	1974
Latest Major Upgrade (Year)	NA
Average-day production	0.100 MGD
Source water	Well 1, Well 3 Well 5, Well 7, Well 8, Well 9, Well 10, Well 11
Population served	1,360
Communities Served	Village of Pemberville
Facility Name	**Bradner Village**
Age of System	1936
Latest Major Upgrade (Year)	NA
Average-day production	0.054 MGD
Source water	Well 4, Well 5, Well 6, Well 7, Well 8
Population served	985
Communities Served	Village of Bradner
Facility Name	**Wayne Village**
Age of System	1977
Latest Major Upgrade (Year)	NA
Average-day production	NA
Source water	Well 1, Well 2, Well 3, Well 4
Population served	941
Communities Served	Village of Wayne

e. Monroe County Water Treatment Plants

Two drinking water treatment plants serve the residents of Whiteford and Bedford Townships in Monroe County, Michigan: The Whiteford Township WTP and the Monroe South County plant (Figure 9-7).

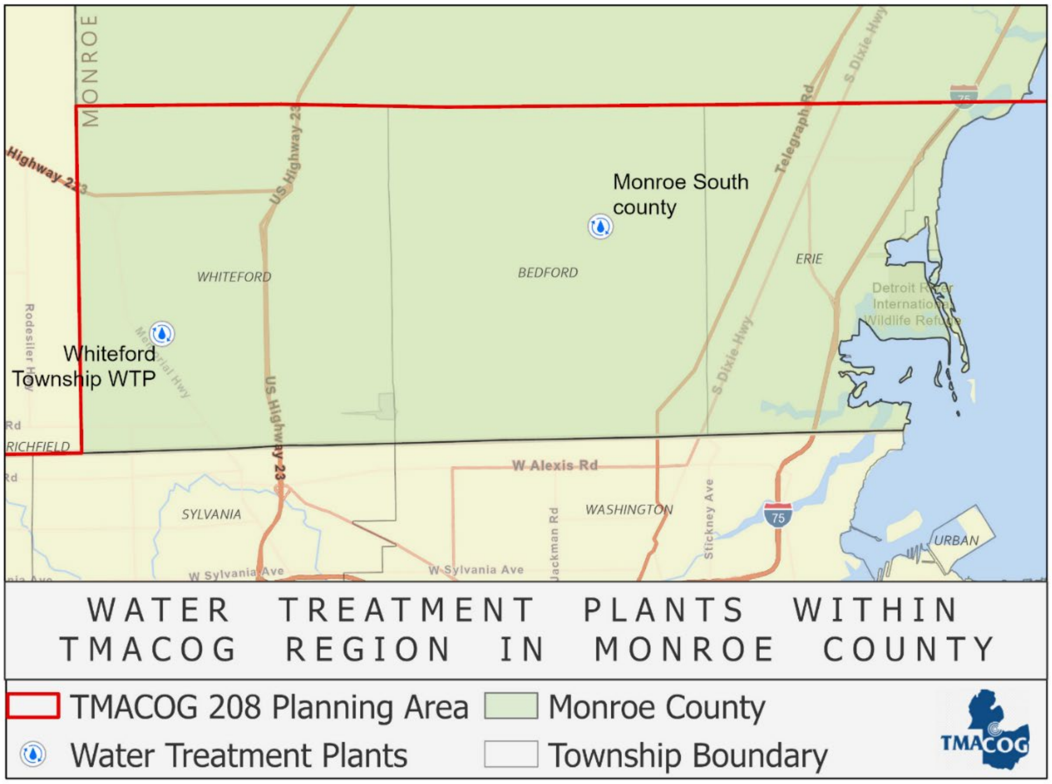

Figure 9 - 7: Water Treatment Plants within TMACOG 208 Area in Monroe County

Table 9 - 5: Summary of Monroe County Drinking Water Treatment Facilities

Facility Name	**Monroe South County**
Age of System	1970
Latest Major Upgrade (Year)	NA
Average-day production	2.32 MGD
Source water	Toledo, Ohio
Population served	42,288
Communities Served	NA
Facility Name	**Whiteford Township Water Treatment Plant**
Age of System	2018
Latest Major Upgrade (Year)	NA
Average-day production	0.50 MGD
Source water	Well 1
Population served	150 homes 7 businesses
Communities Served	Whiteford Township

VI. Drinking Water Challenges

Ensuring safe drinking water remains a critical challenge due to a range of contaminants and environmental factors. The (SDWA) defines contaminant as any "physical, chemical, biological or radiological substance or matter in water". Drinking water may be reasonably expected to contain at least small amounts of contaminants. Some contaminants may be harmful if consumed at certain levels in drinking water. This may expose some people to toxic chemicals like lead, phosphorus, and PFAS. Low-income groups disproportionately bear the consequences of potential exposure due to several intersecting factors. These communities are more likely to live in areas with aging or poorly maintained infrastructure, which increases the risk of contamination from lead pipes, failing treatment systems, or industrial runoff. Financial constraints also limit their ability to invest in home-level solutions such as water filters or bottled alternatives.

i. Contaminants

Lead and Copper Contaminants and Public Drinking Water

On October 8, 2024, the EPA finalized a rule that mandates drinking water systems nationwide to identify and replace lead pipes within 10 years. Lead and Copper Rule Improvements introduce strict water testing requirements and a lower action threshold to enhance community protection from lead exposure. Additionally, the rule strengthens public communication by ensuring that families are informed about lead risks, pipe locations, and replacement plans.

Ohio's Lead and Copper Rule align with federal regulations to protect public health by minimizing lead and copper levels in drinking water. The rule mandates that all Community and Non-Transient, Non-Community Public Water Systems implement corrosion control treatments to prevent these metals from leaching into the water supply, which applies to all drinking water treatment plants (WTPs). This involves regular monitoring of tap water for these metals and maintaining water quality parameters within specified limits. If action levels are exceeded, specifically, lead concentrations above 15ppb or copper concentrations above 1.3ppm, in more than 10% of tap samples, the WTP must undertake additional corrective actions (see Drinking Water Standards for Ohio Public Water Systems).

The Lead and Copper Rule sets action levels for these metals which require water systems in TMACOG's 208 planning area to replace lead service lines when exceedances occur. Despite regulatory efforts, lead exposure remains a risk, especially in older homes with lead plumbing components. Compliance with the updated Lead and Copper Rule Improvements will require water systems to enhance monitoring, reduce lead action thresholds, and increase transparency regarding lead service line locations and replacement plans.

Furthermore, WTPs are required to perform routine monitoring and reporting as stipulated by the Ohio Administrative Code. This includes submitting detailed reports on water quality parameters and any instances of action level exceedances to the Ohio Environmental Protection Agency (EPA).

Table 9 - 6: Annual Detected Lead and Copper Water Treatment Facility in TMACOG Region

WTP	Lead (ppb)	Copper (ppm)	Possible Source of Contaminant	Date Measured	Source
	90% of test levels were less than				
LUCAS COUNTY					
Swanton WTP	2.4 No Violation	0.26 No Violation	Erosion of natural deposits; Leaching from wood preservatives (copper only); Corrosion of household plumbing systems.	2023	Ohio EPA
Toledo WTP	4 (4 out of 131 samples exceeded action level)	0.012 No Violation		2022	Water Quality Report
City of Oregon WTP	0 No Violation	0.03 No Violation		2023	Consumer Confidence Report
OTTAWA COUNTY					
Carroll W & SD	0 No Violation	0.641 No Violation	Erosion of natural deposits; Leaching from wood	2022	Consumer Confidence Report

Marblehead WTP	1 No Violation	0.198 No Violation	preservatives (copper only); Corrosion of household plumbing	2023	Consumer Confidence Report
Ottawa Co Regional WTP	4 No Violation	0.156 No Violation		2022	Water Quality Report
Put-In-Bay WTP	5.89 No Violation	0.777 No Violation		2022	Consumer Confidence Report
SANDUSKY COUNTY					
Clyde WTP No. 1	4 No Violation	0.039 No Violation	Erosion of natural deposits; Leaching from wood preservatives (copper only); Corrosion of household plumbing.	2022	Consumer Confidence Report
Fremont City	0 No Violation	0.028 No Violation		2023	Consumer Confidence Report
Gibsonburg Village	2.9 No Violation	0.125 No Violation		2022	Consumer Confidence Report
Shorewood Village Subdivision	0.950 No Violation	0.223 No Violation		2023	Consumer Confidence Report
Woodville Village	0 No Violation	0.01 No Violation	Corrosion of household plumbing	2023	Consumer Confidence Report
WOOD COUNTY					
Bowling Green City (McDowell WTP)	4 No Violation	0.03 No Violation		2023	Consumer Confidence Report
Bradner Village	N/A	0.28 No Violation		2022	Drinking Water Report
North Baltimore WTP	N/A	0. 025 No Violation	Erosion of natural deposits; Corrosion of household plumbing	2023	Consumer Confidence Report
Pemberville Village	0.6 No Violation	0.366 No Violation	Erosion of natural deposits; Leaching from wood preservatives (copper only); Corrosion of household plumbing.	2023	Consumer Confidence Report
Wayne Village	No Data	No Data			
MONROE COUNTY					
Monroe South county	No Data	No Data			
Whiteford Township WTP	0 No Violation	0.04 No Violation	Lead service line, Erosion of natural deposits; Leaching from wood preservatives (copper only); Corrosion of household plumbing.	2022	Consumer Confidence Report

Nutrient Pollution

Nutrient pollution is one of the most predominant and costly water quality challenges in TMACOG's 208 planning area. Harmful algal blooms (HABs) fueled by nutrient pollution, primarily from agricultural sources, pose a seasonal threat to drinking water sources (See chapter 7 for details), requiring advanced treatment processes to remove algal toxins. Annual HABs are particularly challenging for drinking water facilities drawing from the western basin of Lake Erie, which can experience blooms beginning in late June and extending into October. A 2022 analysis by the Alliance for the Great Lakes found that the average family of five in Toledo pays an additional $100 per year to prevent algal toxins from contaminating their drinking water2. The Maumee Watershed Nutrient TMDL attributes the source of western Lake Erie's algae blooms largely to agricultural nutrients originating in upstream watersheds that extend past local and state boundaries. Source water protection plans can be a planning tool to leverage governmental and private investment to protect source water; however, these plans are not enforceable by state or federal agencies, and local authority to implement source water protection programs is limited to the jurisdiction of the public water system. This leaves public water systems without the authority to control nutrients and other pollutants that impact their source of water.

2 https://greatlakes.org/wp-content/uploads/2022/05/FINAL-COI-Report-051622.pdf

In response to the growing threat of harmful algal blooms (HABs), particularly those producing microcystin toxins, both Ohio and Michigan have implemented regulatory and treatment strategies to protect drinking water systems. The Ohio EPA enforces thresholds of 1.6 µg/L for sensitive populations and 3.0 µg/L for the public which requires public water systems to submit Cyanotoxin Management Plans and conduct routine sampling when bloom conditions are likely (Ohio EPA, 2023). Similarly, Michigan's Department of Environment, Great Lakes, and Energy (EGLE) follows U.S. EPA guidance for microcystin and supports risk-based monitoring, satellite tracking, and public health advisories through coordination with the Michigan Department of Health and Human Services (EGLE, 2022). In terms of treatment, many water utilities in both states have invested in powdered activated carbon (PAC) systems, advanced oxidation processes (AOPs), and membrane filtration to remove toxins from finished water. For example, the City of Toledo has continued to upgrade their system after the 2014 HAB crisis, including PAC feed systems, ozone treatment, and real-time monitoring (City of Toledo, 2020).

Significant changes will need to be made to the way agricultural and urban landscapes are managed to minimize the influx of nutrients to our waterways. Further consideration must be given to the design, construction, and operation of nutrient removal technologies at wastewater treatment facilities. The nature of these changes and the approaches taken by governmental agencies, agri-businesses, farmers, landowners, wastewater treatment service providers and researchers should be constructively debated and quickly implemented.

PFAs and Public Drinking Water

The U.S. EPA issued new PFAS drinking water regulations on April 10, 2024, which set Maximum Contaminant Levels (MCLs) at 4 parts per trillion (ppt) for PFOA and PFOS, and 10 ppt for PFHxS, PFNA, and HFPO-DA (GenX chemicals). In response to growing concerns, Ohio has taken steps to assess and mitigate PFAS contamination. In 2019, Governor DeWine directed Ohio EPA and ODH to launch the PFAS Action Plan 1.0, prioritizing testing in nearly 1,500 public water systems, establishing action levels, and providing resources for both public and private water systems. Recognizing the need for stronger protection, particularly for vulnerable communities, the state upgraded its efforts with PFAS Action Plan 2.0, which expanded sampling, investigations, and funding to support communities at risk. Michigan similarly adopted new PFAS drinking water regulations in August 2020, requiring sampling for seven PFAS compounds across 2,700 water supplies statewide. As PFAS regulations continue to evolve, ensuring that mitigation efforts prioritize the most impacted and underserved populations will be essential in advancing equitable access to safe drinking water.

Table 9 - 7: PFAS Standards in Ohio and Michigan

PFAS Chemicals* Parts per trillion (ppt)	**PFOA**	**PFOS**	**GenX**	**PFBS**	**PFHxS**	**PFNA**	**PFHxA**
Ohio New 2024 Action Levels	4.0	4.0	10	2,000**	10	10	
Michigan	8	16	370	420	51	6	400,000

*PFOA (Perfluorooctanoic Acid), PFOS (perfluorooctane Sulfonate), GenX (HFPO dimer acid), PFBS (perfluorobutanesulfonic acid), PFHxS (perfluorohexane sulfonic acid), PFNA (perfluorononanoic acid). and PFHxA (Perfluorohexanoic Acid)

**Health Based Water Reference Concentration (U.S. EPA 2023)

VII. Impact of Severe Weather on Water Infrastructure

Though the TMACOG planning region has not had as many severe weather event impacts as compared to other regions in the United States, it is likely that drinking water systems will be impacted by extreme weather events in the future (USEPA) Changing weather patterns and aging drinking water infrastructure increases their vulnerability. There has been an increase in the rates of severe weather events such as heat waves, extreme winter weather, cold snaps, ice storms, droughts, and floods. Water availability, quality, and distribution could all be impacted. Extreme weather events also increase the risk of pipe failures, treatment inefficiencies, and contamination. Analyzing water treatment facilities' exposure to severe weather will inform policy decisions and provide solutions to ensure safe and sustainable drinking water for communities now and in the future. This section explores the potential of extreme weather events impacting water treatment facilities in the TMACOG region using spatial analysis and treatment facility operators' perspectives collected via a survey.

i. Exposure to Extreme Heat

A GIS-based analysis was conducted to assess the exposure of public drinking water treatment facilities to severe weather events, including high summer temperatures, winter weather events such as snow and cold snaps, drought, and flooding. MODIS satellite data accessed through Google Earth Engine (GEE) was used to extract summer temperature averages, minimum winter temperatures, average snow cover, and drought indices for the period 2020–2024. All datasets were projected to a common coordinate system, resampled to a 1 km resolution, and normalized using the formula (Pixels-Min)/(Max-Min) to convert pixel values for all the data from 0-1 to ensure comparability across variables.
The map (Figure 9-8) illustrates the varying levels of exposure to extreme heat across the TMACOG region. Areas shaded in red and orange represent zones of very high and high exposure; yellow indicates moderate exposure, and green and blue areas indicate lower levels of exposure. Several water treatment plants such as those in Fremont, Clyde, Wayne Village, and North Baltimore are located in areas of very high heat exposure. This suggests that these facilities may be more vulnerable to the impacts of extreme heat and may require prioritized attention to resilience and adaptation planning for heat-related impacts. In contrast, facilities located in areas shaded green or blue, such as those near the Lake Erie shoreline, face comparatively lower levels of exposure.

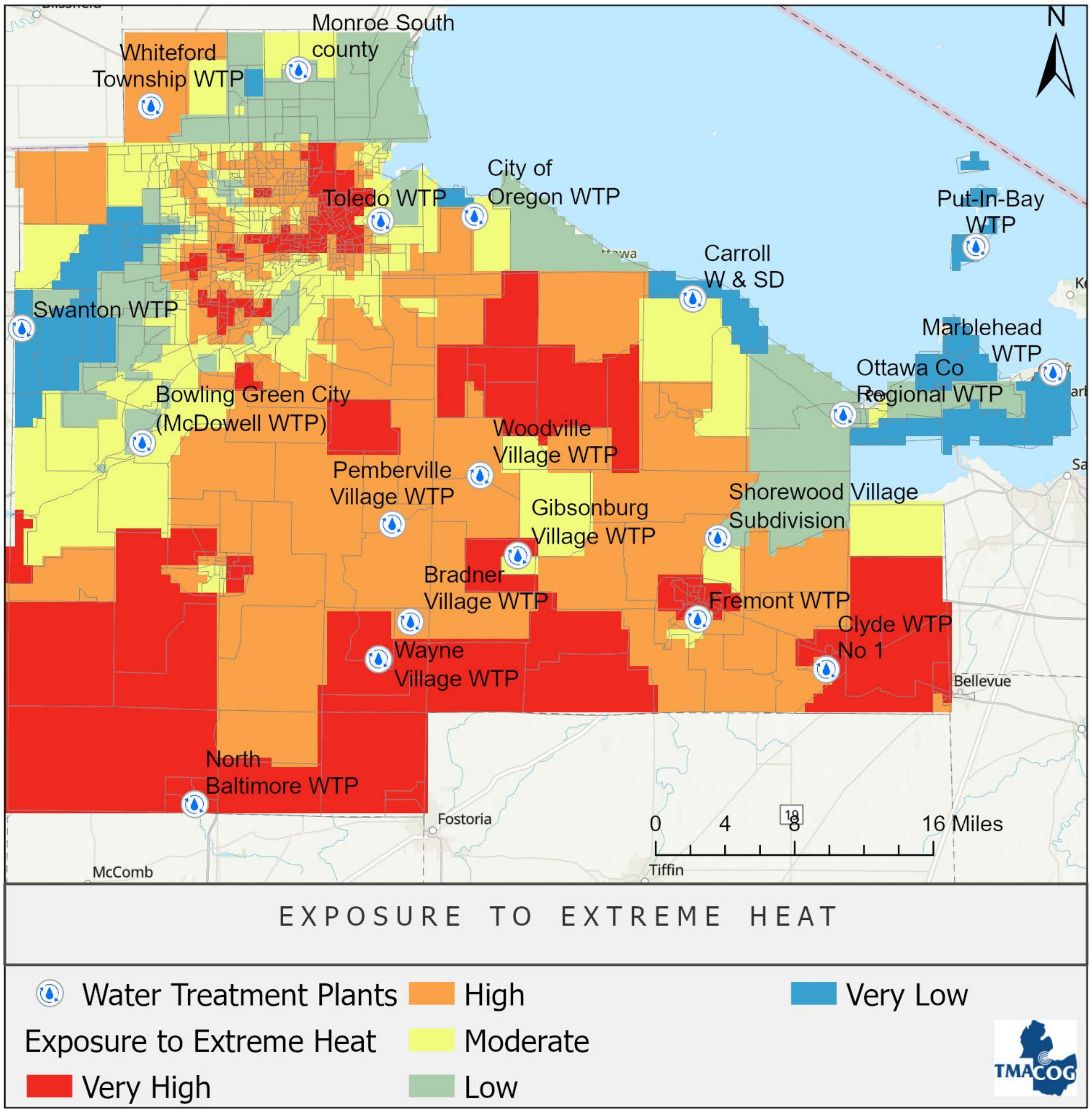

Figure 9 - 8: Water Treatment Facilities Exposure to Extreme Heat

ii. Exposure to Drought

Figure 9-9 shows the distribution of drought exposure across the TMACOG region. Areas shaded in red and orange represent zones of very high and high exposure; yellow indicates moderate exposure, and light green and dark green areas indicate lower levels of exposure. Several water treatment facilities, including those in Toledo, Pemberville, Swanton, and Bradner are located in high or very high drought exposure zones. This indicates a potential vulnerability of these facilities to prolonged dry conditions. In contrast, many of the plants near the Lake Erie shoreline, such as Ottawa County Regional WTP and Put-In-Bay WTP, are situated in areas of low to very low exposure. This spatial pattern highlights the areas that need targeted mitigation strategies for drought stress.

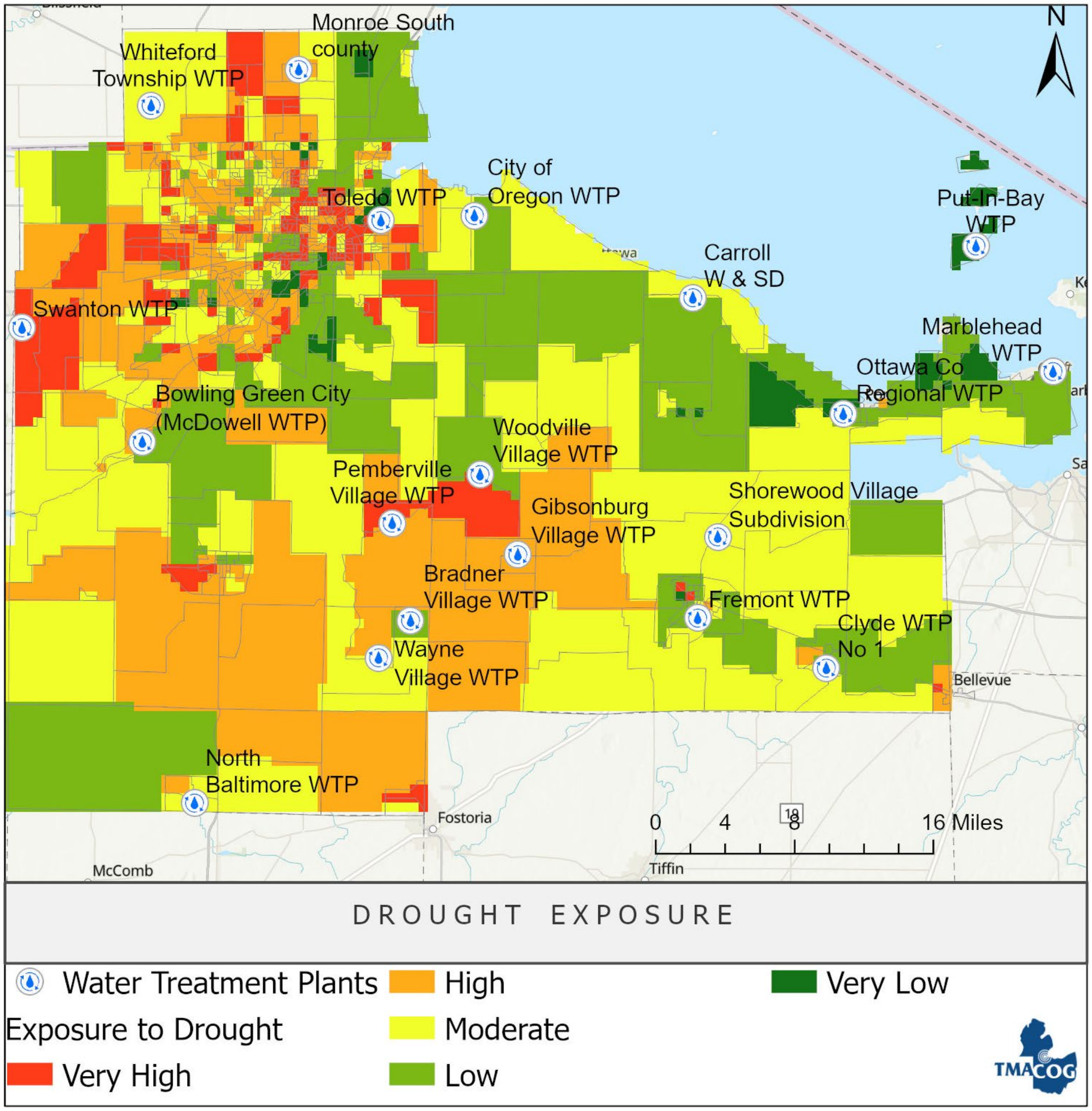

Figure 9 - 9: Water Treatment Facilities Exposure to Drought

iii. Exposure to Winter Weather

A composite winter weather indicator was created by combining winter temperatures and snow cover. Figure 9-10 illustrates the regional exposure of water treatment facilities to winter weather events within the TMACOG area. The color gradient ranges from very low (lightest green) to very high exposure (dark blue). A significant number of facilities, including Ottawa County Regional WTP, Clyde No. 1, and Gibsonburg Village facilities, are located in areas with high to very high exposure, indicating increased susceptibility to cold temperatures and snow-related disruptions. Conversely, facilities like Swanton WTP and Bowling Green City WTP are located in zones of low to very low exposure.

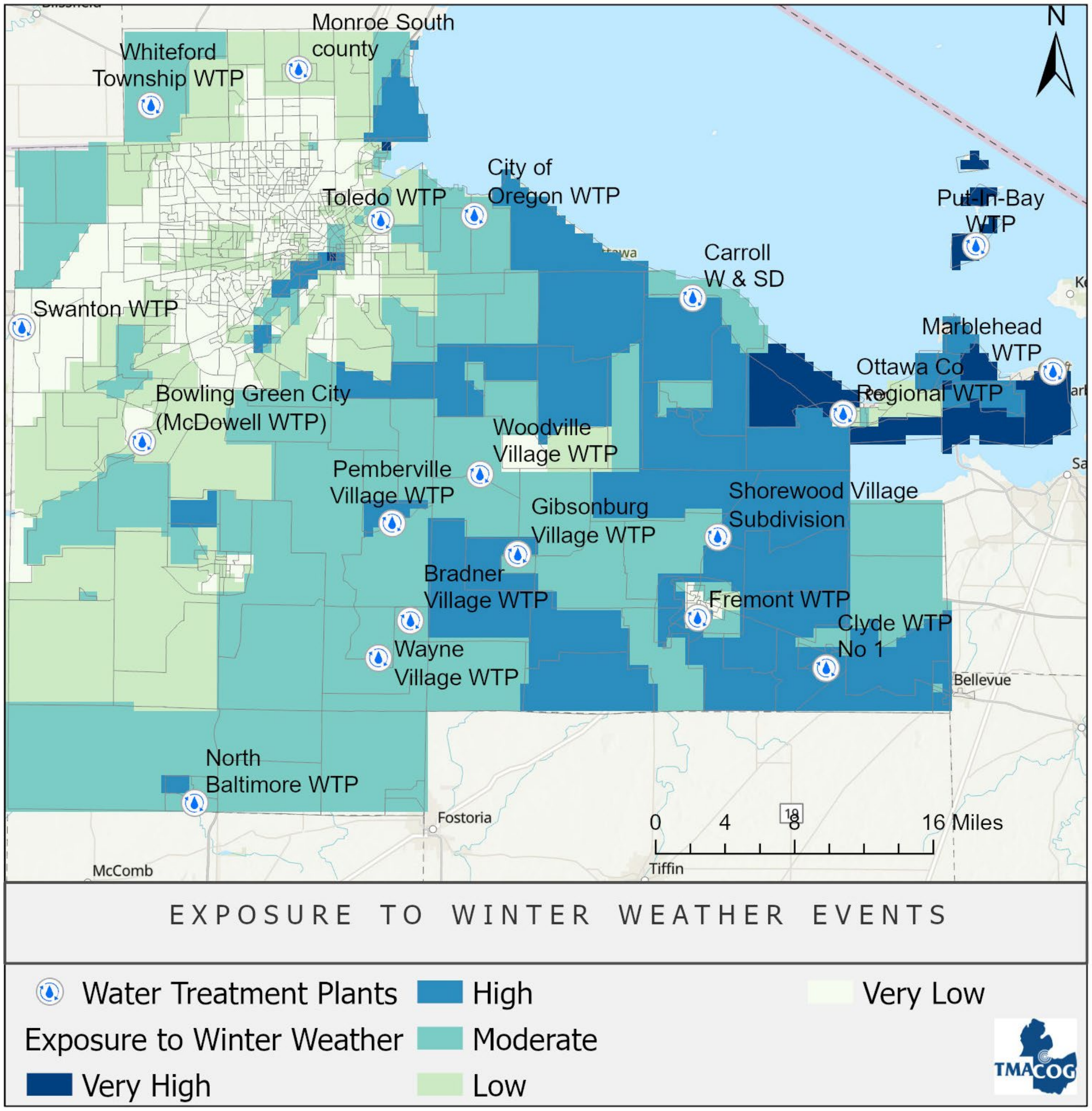

Figure 9 - 10: Water Treatment Facilities Exposure to Winter Weather Events

iv. Exposure to Flood risk

Flood exposure was modeled using precipitation, land cover, digital elevation models (DEMs), and proximity to rivers and streams. Figure 9-11 shows the distribution of flood risk exposure to public water treatment facilities in the TMACOG planning area. Areas shaded in dark blue represent very high exposure to flood risk, while lighter shades indicate lower levels of risk. A cluster of water treatment plants, including Fremont, Clyde, Shorewood, and Ottawa County Regional WTP are located in areas of high to very high flood exposure, suggesting they may be especially vulnerable to flooding events. In contrast, facilities such as North Baltimore and Wayne Village WTPs are situated in areas with low or very low flood risk. These spatial patterns are critical for guiding infrastructure reinforcement and flood mitigation strategies.

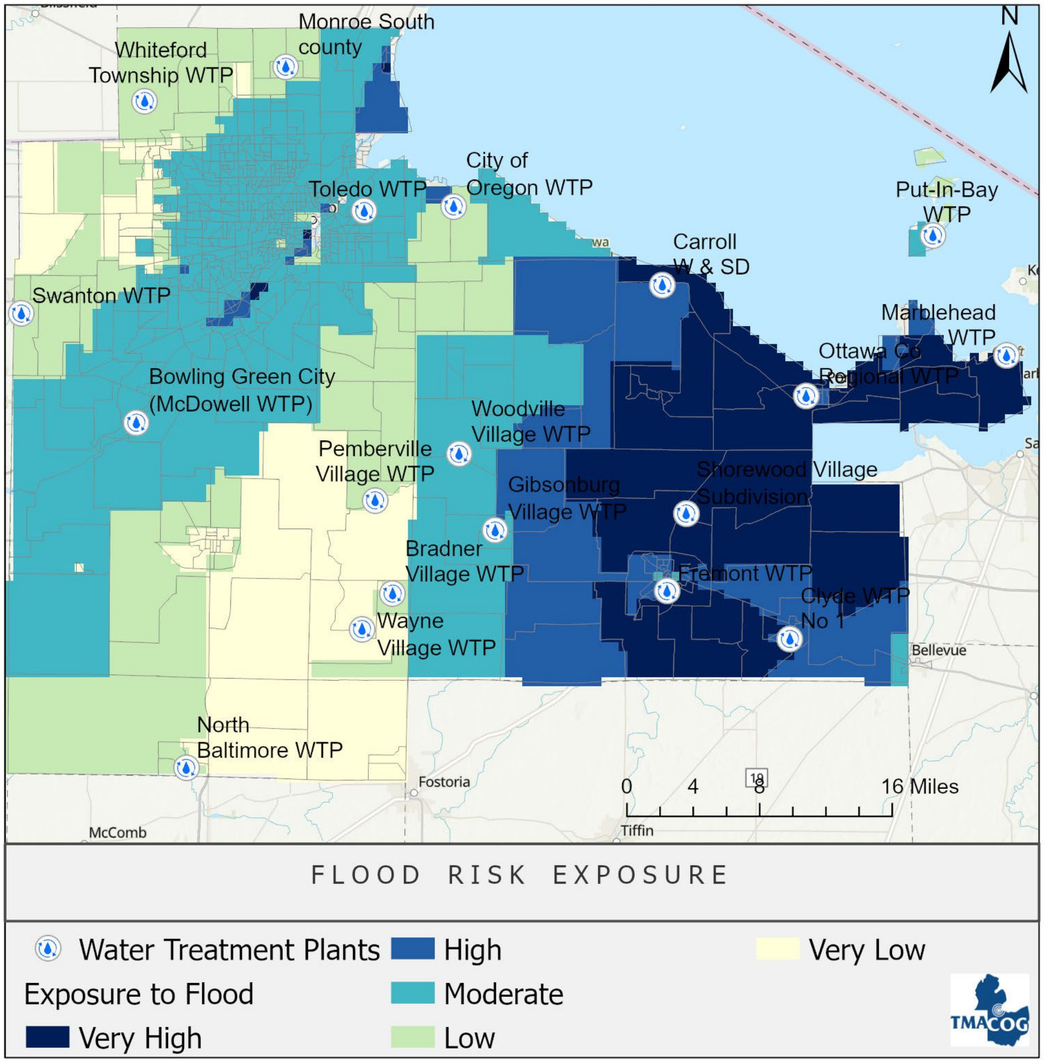

Figure 9 - 11: Water Treatment Facilities Exposure to Flood Risk

v. Total Exposure

Figure 9-12 shows the total exposure of public water treatment facilities to severe weather events across the TMACOG region. Areas shaded in dark blue represent zones of very high exposure, while lighter shades indicate decreasing levels of exposure.

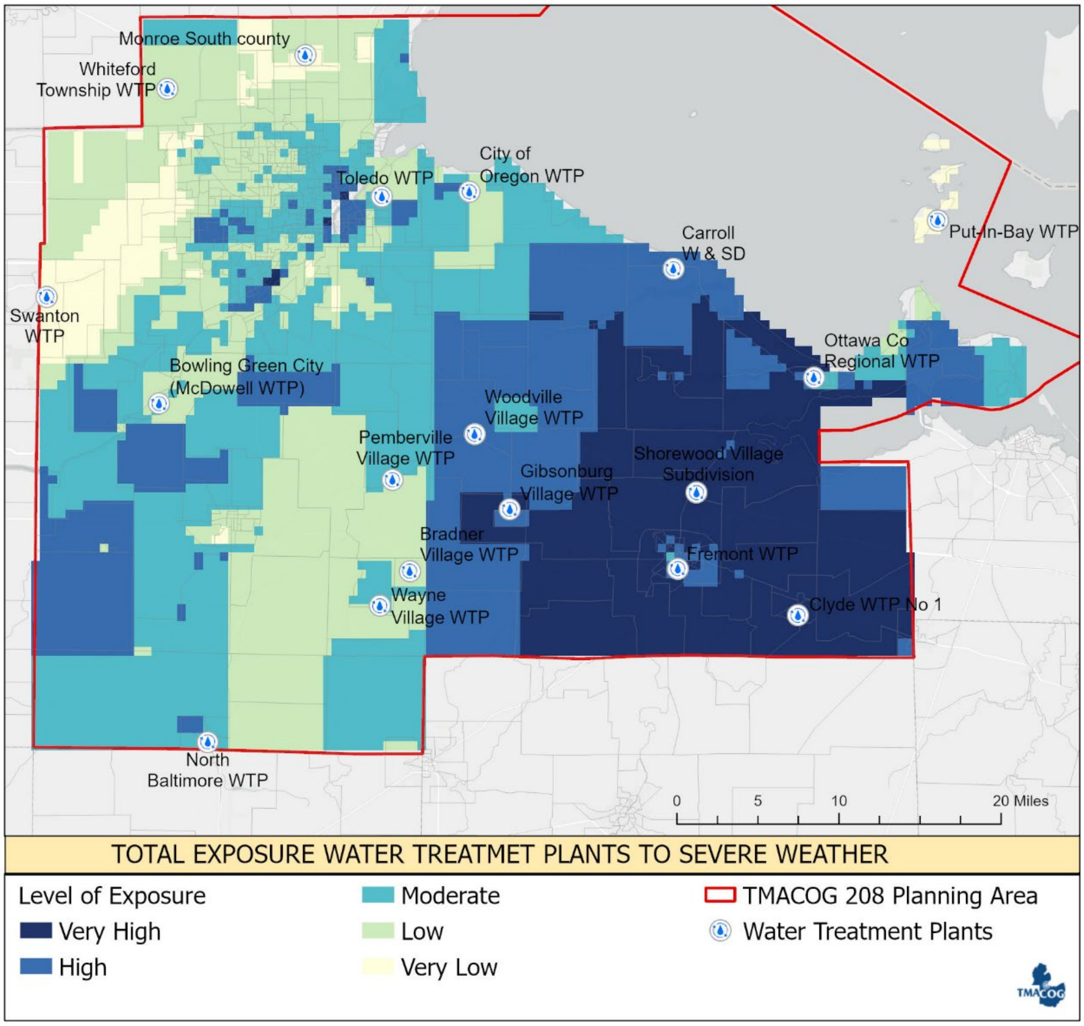

Figure 9 - 12: Total Exposure of Water Treatment Facilities to Extreme Weather Events

vi. Sensitivity of Water Treatment Facilities to Severe Weather Events

A survey was conducted to gather perspectives from water treatment operators on which weather events are likely to impact their facilities. The following are the percentages of respondents who claimed that each weather event has an impact on their facility:

- Extreme Heat =0.7
- Drought =1.0
- Winter Weather = 0.8
- Flooding = 0.6

Facility sensitivity was characterized by using these operator-reported survey responses reflecting observed operational impacts during severe weather events. These responses capture process-level and system-level susceptibility to hazards (severe weather), including treatment disruptions, power reliability concerns, and staffing constraints. Unlike exposure metrics derived from climatological data, the survey-based sensitivity indicators represent empirically observed facility responses to weather stressors and therefore provide a complementary and necessary component of vulnerability assessment.

vii. Vulnerability of Water Treatment Facilities to Severe Weather Events

Vulnerability was quantified by multiplying the sensitivity values by exposure and a weighted sum overlay analysis was used to generate a composite vulnerability index surface, which was then classified into five categories, Very Low to Very High, using the Natural Breaks (Jenks) method. Water treatment facility locations were overlaid on the vulnerability map to identify facilities in high-vulnerability zones. To support decision-making at the census block level, zonal statistics were calculated by aggregating vulnerability values within census block boundaries containing facilities. Figure 9-9 shows the vulnerability surfaces and the water treatments.

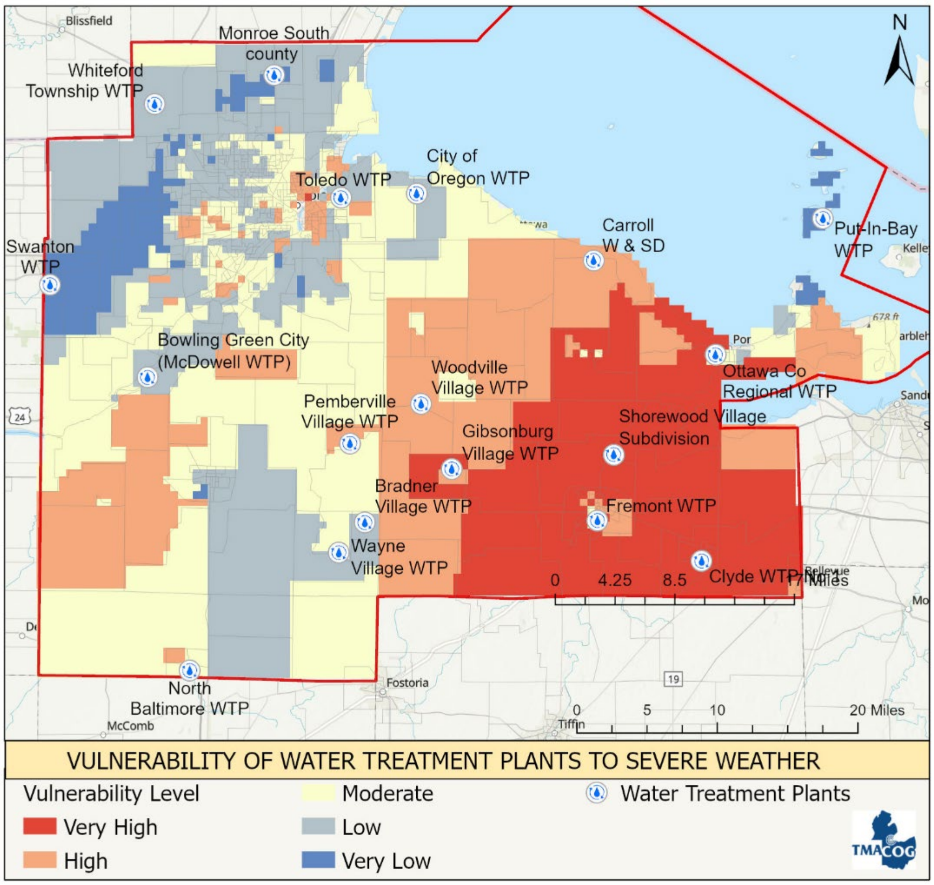

Figure 9 - 13: Vulnerability of Water Treatment Facilities to Extreme Weather Events

VIII. Resources and Support Needs

Strengthening infrastructure resilience to severe weather-related challenges requires key resources and support mechanisms. The operators who responded to the TMACOG survey identified several of these that would enhance their infrastructure's capacity to adapt to extreme weather-related challenges:

- Backup Power and Generators: Reliable backup power systems are critical to preventing service disruptions during extreme weather, yet securing funding for generators remains a challenge.

Several facilities, including Toledo Public Utilities, emphasized the need for federal and state grants to support emergency power generators to prevent disruptions from severe weather.

- Flood Protection Measures: Flood mitigation efforts, such as barriers and improved drainage, require greater investment to protect vulnerable facilities. Facilities that experience flood-related risks expressed the need for increased investment in flood mitigation infrastructure, such as barriers, elevated structures, and improved drainage systems.
- Funding for Equipment and Repairs: Rising equipment and repair costs makes financial assistance essential for maintaining operational capacity. Many facilities reported that equipment costs have risen significantly, and this makes government funding for capital improvements a top priority. Sandusky County, for instance, noted that costs for vehicles and replacement parts have increased due to the reduction of government discounts on procurement.
- Stormwater Drainage System Maintenance: Neglected stormwater drainage systems exacerbate flooding and lead to secondary impacts on water infrastructure. The Village of Whitehouse reported that decades of neglected stormwater ditch maintenance have exacerbated stormwater flooding, leading to secondary impacts on water and wastewater infrastructure.

These indicate that financial support, improved infrastructure maintenance, and investment in resilience strategies are essential to reducing vulnerabilities of water treatment facilities to severe weather events.

IX. Conclusion

The focus of this plan is the structure, regulation, and challenges of public drinking water systems in the TMACOG 208 planning area. While regulatory frameworks under the Safe Drinking Water Act and corresponding state laws in Ohio and Michigan have provided a strong baseline for water safety, there are still concerns that need to be addressed. These include persistent legacy contaminants like lead and copper, emerging contaminants such as PFAS, and increasing threats from harmful algal blooms (HABs) driven by nutrient pollution. Additionally, weather-induced stressors such as extreme heat, drought, winter events, and flooding pose growing threats to aging infrastructure across the region. The extreme weather vulnerable analysis confirmed that some of the key water treatment plants, including those in Fremont, Clyde, Ottawa County, and Shorewood, are highly vulnerable to extreme weather events. Water utilities also face systemic challenges such as rising equipment costs, gaps in stormwater infrastructure, limited authority to manage pollution at the watershed scale, and a shortage of certified water operators. These environmental, financial, and institutional challenges require coordinated, data-driven, and equity-centered action across local, state, and regional partners to ensure the long-term integrity of drinking water services.

- **Policy Recommendations**
  - Local water utilities should prioritize backup power installations at high-weather exposed facilities. The water treatment facility operators should coordinate with state emergency management agencies to install or upgrade backup generators for facilities that are highly vulnerable to extreme weather events. [VIII]

- Flood mitigation infrastructure development should be prioritized at facilities that are highly vulnerable to floods.
    - Allocate capital improvement funding to install flood protection barriers, raise critical system components, and upgrade site drainage systems at the above facilities [VII, & VIII].
- Targeted Resilience Planning for Facilities in Very High Vulnerable Zones
    - Require these facilities to develop and submit climate resilience adaptation plans that address site-specific risks (e.g., drought-resistant intakes, cooling for heat)[VII]
- Local governments in the TMACOG region should develop PFAS Response Plans for Systems with Known Detections. [VI (i)]
- Local governments in the TMACOG region should work collaboratively to evaluate all options to create redundancy in the regional water supply and source of water. [V (ii)]
- TMACOG should continue to collaborate to create and maintain an inventory of water supply infrastructure to facilitate emergency water supplies and serve as a resource for asset management planning. [VII]
- Asset management plans should ensure the long-term sustainability of managerial, technical, and financial capability of all drinking water systems in the region and should include emergency preparedness plans and risk and resiliency assessments [VIII]

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