2027 CWSRF PROJECT PLAN

Combined Sewer Separation and North Rose Sanitary Pump Station Replacement

Prepared For
The City of Mount Clemens

Prepared by:

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Executive Summary

The City of Mount Clemens has engaged Anderson Eckstein, and Westrick, Inc. (AEW), the City's consulting engineer, to develop a Project Plan in order to apply for a Clean Water State Revolving Fund (CWSRF) loan through the Michigan Department of Environment, Great Lakes and Energy (EGLE). This Project Plan was prepared for in accordance with CWSRF Project Planning Document Preparation Guidance (January 2023).

The intent of the CWSRF Project is to perform the separation of existing combined sewers within a targeted residential service area and to upgrade the North Rose sanitary pump station. The goal of the CWSRF Project is to reduce the risk of sewer overflows and enhance the long-term reliability of the wastewater and stormwater infrastructure in the City. Based on the analysis summarized in this project plan, two projects were selected.

1. **Combined Sewer Separation**

Mount Clemens owns and operates a sanitary and combined sewer system that serves the entire city. Several areas throughout the City are serviced by just a combined sewer which takes in stormwater and wastewater in residential areas. The proposed comprehensive combined sewer separation project involves separating combined sewers in several locations throughout the City. The first project area is along Lois Lane, identified as C31 on the Combined District Area Map. The second area is located on Kendrick Avenue between Madison Avenue and North Avenue, shown as C12 on the map. The remaining project areas are situated within rear alleys behind residences east and west of Moross Avenue, both north and south of Church Street. An additional alley between Highland Avenue and South Wilson Boulevard, located just south of Church Street, is also included. These alley areas are designated as C23 and C26 on the Combined District Area Map included in Appendix A.

The comprehensive combined sewer separation will involve installing new dedicated stormwater infrastructure to convert the existing combined sewer into separate storm and sanitary sewers. This effort will eliminate unnecessary stormwater flows to the combined sewer system and decrease the likelihood and volume of combined sewer overflows in residential areas. A preliminary cost estimate for the sewer rehabilitation project is included in Appendix J. The cost of this project is estimated to be $2,500,000.00.

2. **N. Rose Pump Station Replacement**

The City of Mount Clemens owns and operates several pump stations located throughout the city, including one on N. Rose just north of N. Christine Circle. The City of Mount Clemens is looking to replace the forementioned pump station in order to support long-term system reliability.

A preliminary cost estimate for the Pump Station Replacement project is included in the appendix. The cost of this project is estimated to be $3,700,000.00.

The total cost of the CWSRF Project is $6,200,000.00. The CWSRF loan is anticipated to be financed for a 20-year term at 1.875 percent interest. Debt service must be financed by a sewer system user charge system (UCS) that is consistent with the Environmental Protection Agency (EPA) and EGLE guidelines.

Background

Study and Service Area

The City of Mount Clemens is located in Macomb County and is the seat of the County. Mount Clemens borders Clinton Township to the north, south and west and Harrison Township to the east.

The project study area encompasses the sanitary and combined sewer system owned by Mount Clemens. The Study Area Maps are presented in Appendix A. The study area maps identify the existing sewer system, the location of the proposed improvements and the location of the WWTP and proposed improvements.

Existing land use data, by category, was provided by Southeast Michigan Council of Governments (SEMCOG) for the study area and is included in Appendix B (SEMCOG Community Profile).

Single-family residential homes occupy the largest share of the study area's total acreage consisting of 888.1 acres. Existing single-family development is concentrated in platted subdivisions within the city.

Multiple-family residential occupies 87.3 acres of land. Most multiple-family development in the study area is primarily located in the vicinity of the major roads.

Commercial and Office developments occupy 71.8 acres of land. Office development is located principally along all the principal and minor arterials and the major collector streets located in the city. Most of the commercial developments are located in a linear fashion along North and South Rose Street.

Industrial developments occupy 233.9 acres of the study area's land.

Institutional developments occupy 132.8 acres of the study area land. Institutional development is generally scattered throughout the study area.

A table summarizing the acreage of each category in the study area (that being the entire city) as well as the land use changes from 2015 to 2020 can be found in the SEMCOG Community Profile in Appendix B.

Population

The residential population for Mount Clemens is 15,697 people, based on 2020 Census data. Seasonal fluctuations due to resorts or tourism are negligible. According to SEMCOG, the population projections for the city in 2030, 2040 and 2045 are 15,979, 16,373 and 16,345, respectively.

Existing Environment Evaluation

Cultural and Historic Resources

The projects discussed in this project plan are confined to previously constructed wastewater and stormwater infrastructure located in publicly owned property or public Right of Way which has already been developed. Consequently, the proposed projects are not expected to impact cultural or historic resources.

Air Quality
There are no known air quality issues in Mount Clemens. Emissions from heavy equipment can be expected during construction. However, it is expected that these emissions will have a negligible long-term impact on air quality in Mount Clemens.

Wetlands
Several wetland areas have been identified within Mount Clemens, as shown in Appendix F. The proposed project locations are not located within close proximity and are not expected to impact any wetlands.

Great Lakes Shorelands, Coastal Zones, and Coastal Management Areas
Mount Clemens is a landlocked community surrounded by neighboring communities along the entirety of their border. However, the Clinton River runs through the lower half of the City. The southeast portion of Mount Clemens is located in a Coastal Zone Management Area. As shown in Appendix C. Consequently, the proposed projects are located in the northwestern parts of the City and are not expected to impact Great Lakes Shorelands, Coastal Zones, and Coastal Management Areas.

Floodplains
There are several areas of Flood Hazards within Mount Clemens. FEMA flood map panels for Mount Clemens are included in Appendix D. Consequently, the proposed projects are not expected to impact floodplains and are not located in any flood hazard areas.

Natural or Wild and Scenic Rivers
There are no Natural or Wild and Scenic Rivers within Mount Clemens. Consequently, the proposed projects are not expected to impact floodplains.

Major Surface Waters
The Clinton River runs through the City of Mount Clemens. Consequently, the proposed projects are not expected to impact major surface waters.

Topography
According to the United States Geographical Survey (USGS) map as shown in Appendix E. Elevations range from approximately 600 ft at the western most portion of the city to 605 ft along the northern border of the city. The elevation of the eastern most portion of the City is approximately 575 ft. The elevation along the Clinton River is approximately 575 ft. In general, the average elevation throughout the city is 600 feet.

Geology
There are no geological structures or formations in the vicinity of the proposed projects.

Soil Types
Soil conditions throughout the city are classified generally as being silty sandy clay loam. Much of the city has soil stratum that consists of varying depths of fine sand, medium stiff moist gray silty clay, soft moist gray silt clay and bed rock. A map of the existing soils in Mount Clemens is included in Appendix F.

Agricultural Resources
There is no agricultural land within the Mount Clemens. Consequently, the proposed projects are not expected to impact agricultural resources.

Fauna and Flora

The projects discussed in this project plan are confined to previously constructed wastewater infrastructure located in publicly owned property or public Right of Way which has already been developed. Consequently, the proposed projects are not expected to impact any natural habitats. However, the MSU Extensions will be contacted to ascertain whether any species of fauna or flora listed or proposed to be listed in the MNFI as endangered or threatened, or the critical habitat of such species, is found in the vicinity of the proposed projects.

Existing System

Mount Clemens is a fully developed community served by a separate sanitary and combined sewer system. A map of the combined sewer service area for the proposed sewer separation project and system is included in Appendix A. A map of the service area for the North Rose pump station is also included in Appendix A. All sanitary and combined sewer flow is treated at the Mount Clemens Waste Water Treatment Plant, located at 1750 Clara Street. The facility treats the sewage, or during extreme wet weather events, it utilizes its Retention Treatment Basin prior to a potential discharges to the Clinton River.

Mount Clemens began developing in the early 1800's. The oldest sewers in operation are over 130 years old. A hydrologic and hydraulic study has not been conducted for the combined sewer system. Additionally, due to the incremental nature of development over an extended period of time, the system in these areas does not have a known design capacity.

Mount Clemens has not experienced sanitary sewer overflows (SSO) or combined sewer overflows (CSO) in several years. However, the City experiences basement sewer backups during the Spring and Summer yearly. These basement sewer backups generally take place in mostly combined sewer areas. The area near Madison Street between Parkview and Dorothea includes several residential streets along with a hospital. Due to the combined nature of portions of the sewer system, it is vulnerable to increased basement flooding risk as a result of increased intensity storm events.

Need for the Project

The sanitary and combined sewer system is a gravity system that discharges into the WWTP and from there treated flow is discharged to the Clinton River. Therefore, NPDES compliance, discharge permits and the Discharge Data Form are applicable to Mount Clemens and shown in Appendix G.

There are no court orders, federal or state enforcement orders, or administrative consent orders involving Mount Clemens.

Mount Clemens is an established community where the entire city has been sewered in the past and as such there are no known septic systems.

Based on population projection information provided by SEMCOG, the city is predicted to slightly increase in population over the next 20 years.

The goal of the CWSRF project plan is to separate the combined sewer areas at the locations listed above into a separate storm and sanitary sewer. Also, the pump station located at North Rose Street will be replaced to address aging equipment components that have reached the end of their useful life. Replacement of the pump station will improve hydraulic capacity, system redundancy, and operational reliability, particularly under post-combined sewer separation flow

conditions. These improvements will reduce the risk of service interruptions, emergency maintenance, and sanitary sewer backups.

As Part of the CWSRF Project Plan, two projects have been proposed to improve the reliability of the existing system.

1. Combined Sewer Separation
2. Pump Station Upgrades

1. The CWSRF loan will provide Mount Clemens a funding mechanism to address projects identified as critical priority. The City of Mount Clemens has several combined sewer areas located throughout the City, and this loan will assist with addressing areas that experiences overflows and flooding. The installation of new storm sewer pipe will extend the service life of the existing combined sewer location in these areas due to decreased flow from stormwater.

2. The CWSRF loan will provide Mount Clemens with a funding mechanism to address the necessary improvements that are required at the pump station. Upgrading the pump station will reduce operation risks and support long-term system sustainability.

Projected Future Needs

Due to the fact that Mount Clemens is both fully developed and is also predicted to experience only a slight population increase, residential wastewater is not expected to increase over a period of 20 years and was not considered in this project plan.

Analysis of Alternatives

The goal of the CWSRF project plan is to reduce the number of combined sewer areas located in residential districts of the City and to upgrade an existing sanitary pump station that services a large residential area in the northeastern part of the City.

No Action

The No Action alternative represents the decision to do nothing beyond the cleaning of the combined sewers that has already taken place as part of the previous cleaning and televising program. Abandoning efforts to separate the combined sewer will cause continued overflow and basement flooding in a predominantly residential area. Such failures would result in large capital expenditures that are not typically anticipated by the City, including but not limited to, sewer backups, localized street flowing, and structural deterioration of sewer infrastructure.

Similarly, if no action is taken to address the deteriorating pump station, the City will experience an increased risk of mechanical failure due to the pump station equipment being beyond its useful life. Additionally, a pump station failure or reduced capacity can cause upstream sanitary sewers to surcharge, potentially leading to sanitary sewer overflows.

The long-term impact of the no action alternative is cost prohibitive and not in the best interest of the city.

Optimum Performance of Existing System

This project is intended to address issues related to combined sewer flowing and aged components of the pump station. Consequently, optimizing performance of the system cannot resolve existing structural issues or aged components of the pump station. Therefore, the Optimum Performance of Existing System alternative was not considered an applicable option.

Regionalization

The issues identified within the combined sewer system are limited to the local service areas in Mount Clemens. Consequently, the regionalization alternative is not considered viable or practical for the deficiencies evaluated in this project plan.

Monetary Evaluation

The most cost-effective installation methods was determined by evaluating feasible options to separate a combined sewer. Open cut trenching installation was evaluated as the most feasible and cost-effective option. Preliminary cost estimates have been prepared for the Combined Sewer Separation project. Fishbeck has prepared a preliminary estimate and options for the pump station upgrades. The preliminary construction cost estimates are included in Appendix J.

Sunk Costs

Per the project planning document guidance, sunk costs were not included as a part of the monetary analysis as they are costs incurred regardless of what alternatives are selected. Sunk costs include the cost to operate and maintain the existing sewer system and pump stations and the associated lands, all outstanding debts and the cost incurred to prepare this project plan.

Present Worth

A present worth analysis, covering the 20-year planning period, was conducted. The discount rate used to calculate the present worth is 7% according to the Federal Office of Management and Budget (OMB). The present worth analysis calculations are included in Appendix K. The present worth was calculated using the following steps:

- Determine the capital cost. The construction costs from the estimates are for current value and are assumed to be present worth.
- Determine the salvage value at 20 years for each alternative using straight-line depreciation.
- Given the future salvage value, the present worth of the salvage value can be calculated as the salvage value at 20 years, multiplied by the single payment present worth factor of 0.4146 to determine present worth from a future amount in 20 years.
- Interest during construction has been calculated as 7.0 percent multiplied by the construction period in years and the total capital cost. The total is then multiplied by 0.5. This is per the guidance document for construction periods less than four (4) years.
- The total present worth is calculated by deducting the present worth of the salvage value at 20 years and the present worth of revenue generated from the sum of the present worth of the capital costs and the interest during construction.
- The equivalent annual cost is calculated by multiplying the total present worth by the capital recovery factor of 0.09439, to determine the annual cost for 20 years based on the total present worth.

Salvage Value
In accordance with the Project Planning Document Preparation Guidance the salvage value at the end of the 20-year planning period was calculated using straight line depreciation with a useful life of 50 years.

Escalation
The proposed projects are not expected to result in the purchase of more land or increases in energy use. Consequently, escalation costs were not considered in the monetary analysis.

Interest During Construction
The construction period is expected to be less than four years. As a result, interest was calculated as one half of the product of the construction period (in years), the total capital expenditures (in dollars), and the real discount rate.

User Costs
The combined sewer system is made up of 9,799 residential equivalency units (REU's). Based on the present worth analysis, the equivalent annual cost of the CWSRF projects is $461,606.06. Therefore, the estimated annual costs per REU is $47.11.

Project Delivery Method
The traditional Design-Bid-Build delivery method will be utilized for the CWSRF projects. Therefore, the project delivery method was not considered in the monetary evaluation.

Environmental Evaluation

All improvements proposed within this project plan will be made to existing wastewater infrastructure. Additionally, the construction methods themselves are expected to have minimal environmental impact. Soil erosion and sedimentation control measures are included in the capital cost of the project and enforced during construction.

Selected Alternative

Design Parameters

1. **Combined Sewer Separation**

The City of Mount Clemens GIS application included a layer that shows all the areas throughout the City that are serviced by combined sewers. All these areas were analyzed in previous years to determine approximate costs and difficulty of constructing improvements. The design approach focuses on improving conveyance efficiency, reducing wet-weather flow contributions to the sanitary system, and decreasing the likelihood of combined sewer overflows and basement backups.

The most cost-effective repair method was determined to be an open cut trenching construction for the proposed storm sewer pipe installation. The use of a retention pond was analyzed but determined not to be feasible due to the location of this combined sewer areas. Reviewing the surrounding properties and City right-of-way, property acquisition would be required to construct a retention pond to hold the storm water in that area.

The recommended projects design elements include:

- Construction of new storm sewer truck lines with lateral connections.

- Conversion of existing combined sewers to sanitary-only use, which includes disconnection of catch basins and re-connecting to new storm sewer.
- Replacement or rehabilitation of sanitary sewers where existing conditions are structurally deficient.
- Installation of new manholes and adjustment of existing structures.

The locations of all proposed storm sewer alignment proposed to separate the existing sewer is shown as a markup on a utility map, which is shown in Appendix I.

2. Pump Station Upgrades

The North Rose Sanitary Pump Station replacement has been designed to address aging infrastructure, improve system reliability, and support long-term sanitary conveyance following completion of the combined sewer separation project. The design prioritizes operational redundancy, hydraulic efficiency, ease of maintenance, and resiliency under both dry-weather and peak wet-weather flow conditions.

The upgraded pump station will be designed to reliably convey sanitary flows from the service area under post-separation conditions, accounting for the removal of stormwater inflow from the combined system while maintaining sufficient capacity for infiltration and inflow during significant precipitation events. The new installation will replace existing mechanical, electrical, and control components that have reached or are nearing the end of their useful life.

- The design will provide sufficient redundancy so that the peak design flows can be conveyed with one pump out of service, minimizing the risk of upstream surcharging or sewer backups.
- Pumps will be sized to accommodate anticipated post-separation sanitary flows with adequate firm capacity and redundancy, allowing the station to operate reliably during peak conditions and maintenance events.
- Replacement of existing electrical equipment with new motor control centers, variable frequency drives, and programmable logic controls to improve operation efficiency and system responsiveness.
- The pump station will include remote monitoring and alarm capabilities to provide real-time system status, enhance operator response times, and reduce the likelihood of unnoticed failures.

Useful Life

Open cut sewer repairs and pipe bursting sewer repairs, sewer rehabilitation by FCIPP, and sewer rehabilitation by SCIPP all have useful life expectancy exceeding 30 years. Concrete sewer has a life expectancy between 75 – 100 years. PVC pipe has a life expectancy around 100 years. Appendix N has back up data for useful life estimates.

The proposed improvements at the Sanitary Pump Stations are expected to have a useful life of at least 20 years with proper maintenance.

$$weighted\ useful\ life = \frac{(Pipe\ rehabilitation\ dollar\ value\ \$1{,}512{,}000 * 87.5\ years) + (\ Sludge\ press\ cost\ \$2{,}220{,}000 * 25\ years)}{\$6{,}200{,}000.00}$$

Weighted useful life = 30 years

The weighted useful life calculation determines an overall project useful life of 30 years.

Project Maps

See Appendix A for a map identifying all work areas associated with the proposed CWSRF Projects.

Water and Energy Efficiency

Proposed improvements on this project will include the construction of a new storm sewer alongside the existing combined sewer in the areas listed above. Improvements on the pump station will be made to a previously construction pump station. Consequently, the water and energy efficiency alternatives are not considered as part of this project.

Schedule for Design and Construction

A preliminary schedule for design and construction of the selected alternatives is presented below:

Publish public hearing notice	4/2/2026
Conduct formal public meeting	4/20/2026
Public comment period ends	4/20/2026
City Commission approves resolution to proceed with project plan	4/20/2026
Project plan submittal to EGLE	5/1/2026
Submit engineering plans for required permits	12/31/2026
Part I application due (financial documentation and assurances)	1/4/2027
Part II application due (submit approved UCS and project plans)	1/4/2027
Publish advertisement for bids	2/1/2027
Part III application due (bid tabulation with tentative award)	3/10/2027
Order of Approval issued	4/12/2027
Loan close	5/6/2027
Conduct preconstruction meeting and issue notices to proceed	5/14/2027
Start construction	6/1/2027
Mitigation of environmental impacts	6/1/2027
Project completion	5/31/2028

Cost Summary

The total cost of the CWSRF Project is estimated to be $6,200,000.00. The CWSRF loan is anticipated to be financed for a 20-year term at 1.875 percent interest. Debt service must be financed by a sewer system user charge system (UCS) that is consistent with the Environmental Protection Agency (EPA) and EGLE guidelines.

Implementability

The City of Mount Clemens is a municipal unit organized under the State of Michigan Constitution and statutes and is legally able to own and operate public utilities. The city owns and operates its public water system and combined sewer system. All improvements proposed as a part of this project will be completed within city owned utility infrastructure and city owned property. All city-owned sewers are located within a city owned utility easement or public rights-of-way.

The selected alternatives will not pose any issues related to the implementability of the project. Mount Clemens has the legal authority, managerial capability, and financial means to build, operate, and maintain the system. Mount Clemens passed a resolution to adopt this Project Plan at the April 20, 2026 City Commission meeting.

Environmental and Public Health Impacts

Direct Impacts

Cultural and Historic Resources

The projects discussed in this project plan are confined to previously constructed wastewater infrastructure located in publicly owned property or public Right of Way which has already been developed. Additionally, the National Register of Historical Places does not include any locations within Mount Clemens. Consequently, the proposed projects are not expected to impact cultural or historic resources.

Air Quality

Emissions from heavy equipment can be expected during construction. However, it is expected that these emissions will have a negligible long-term impact on air quality in Mount Clemens.

Wetlands

Several wetland areas have been identified within Mount Clemens. The proposed projects are not expected to impact wetlands.

Great Lakes Shorelands, Coastal Zones, and Coastal Management Areas

Mount Clemens is a landlocked community surrounded by neighboring communities along the entirety of their border. However, the Clinton River runs through the lower half of the City. The southeast portion of Mount Clemens is located in a Coastal Zone Management Area. As shown in Appendix C. Consequently, the proposed projects are not expected to impact Great Lakes Shorelands, Coastal Zones, and Coastal Management Areas.

Floodplains

There are several areas of Flood Hazards within Mount Clemens. FEMA flood map panels for Mount Clemens are in Appendix D. Consequently, the proposed projects are not expected to impact floodplains and are not located in any flood hazard areas.

Natural or Wild and Scenic Rivers

There are no Natural or Wild and Scenic Rivers within Mount Clemens. Consequently, the proposed projects are not expected to impact floodplains.

Major Surface Waters

The Clinton River runs through the City of Mount Clemens. Consequently, the proposed projects are not expected to impact major surface waters.

Agricultural Resources

There is no agricultural land within the Mount Clemens. Consequently, the proposed projects are not expected to impact agricultural resources.

Fauna and Flora

The projects discussed in this project plan are confined to previously constructed wastewater infrastructure located in publicly owned property or public Right of Way which has already been developed. Consequently, the proposed projects are not expected to impact any natural habitats. However, the MSU Extensions will be contacted to ascertain whether any species of fauna or flora listed or proposed to be listed in the MNFI as endangered or threatened, or the critical habitat of such species, is found in the vicinity of the proposed projects.

Construction Impacts

The proposed work for the project is generally limited to the public right-of-way where streets may be impacted depending on the location of the existing sewers or to City owned property not open to the public. Construction methods are selected to minimize disruptions. Standard traffic and safety control devices meeting MDOT construction standards such as barricades and lighted barrels will be in place to warn and protect residents during construction activities.

Where sewer main replacement work is taking place within or near road rights-of-way, roads may have to be partially or completely closed to vehicular and/or pedestrian traffic. In addition, construction equipment and vehicles will have to be parked within the road right-of-way for a specified period of time.

Closures may result in the re-routing or postponement of garbage pick-up, mail delivery, parcel delivery and other deliveries to residences and businesses. Access for emergency vehicles and access for handicapped or disabled persons will also require attention.

Consideration must be taken to establish haul routes that minimize impact to residents and businesses. Construction truck traffic will be confined to the construction project itself and accessing the sites from major roads only. No truck traffic will be allowed to be on adjacent residential streets.

During the course of construction, the noise level will be increased as a result of construction equipment and truck traffic.

Where open cut excavations will take place, special attention will be required when stockpiling excavated materials in addition to other material stockpiles and their locations to not interfere with existing drainage patterns and transfer particulates into the drainage system. Soil erosion and sedimentation control measures such as, but not limited to silt sacks, filter fabrics and straw bales will be installed at storm water facilities as part of the construction activities to prevent soil erosion and sedimentation concerns.

The vegetation to be disturbed for this project are grass areas maintained by each property owner. Any disturbed area will be restored. Tree removals may be necessary. Any miscellaneous tree removal will be replaced with a tree of compatible species native to the area.

Any contamination encountered during construction will be remediated by the contractor.

Operational Impacts

The proposed sewer separation project will result in changes to the current sewer system, operational or otherwise. Some short-term impacts to residential areas include traffic disruptions, road closures, and temporary limited access to properties within the project area. These impacts are expected to be temporary and will be minimized through construction staging, traffic control, and restoration requirements.

The proposed pump station upgrades will not result in changes to the current system, operation or otherwise. Temporary impacts will be carefully managed to maintain uninterrupted wastewater service throughout construction. Temporary bypass pumping will occur around the pump station during construction to ensure continuous system operation and to prevent service interruptions or sewer overflows.

Social Impacts

Minor increases in rates may be a social impact of the project if the city chooses to increase rates to finance the loan debt. Additionally, traffic impacts discussed in the Construction Impacts section of the report can be considered a social impact. Long-term impacts related to relocation of business or residents due to these projects are not expected due to the nature of the proposed projects.

Indirect Impacts

Due to the fact that the service area is fully developed, the proposed projects are confined to previously constructed wastewater infrastructure, and the service area is predicted to experience population decline, there are no anticipated indirect impacts to the following aspects:

- Changes in rate, density, or development type
- Changes in land use
- Changes in air or water quality
- Changes to the natural setting or sensitive features
- Impacts on cultural, human, social and economic resources
- Impacts on area aesthetics
- Resource consumption over the useful life of the project

Cumulative Impacts

Due to the fact that the service area is fully developed, the proposed projects are confined to previously constructed wastewater infrastructure, and the service area is predicted to experience population decline, there are no anticipated indirect impacts as a result of the proposed projects to the following aspects:

Mitigation

Mitigation of Short-Term Construction Related Impacts

General Construction

Many mitigation techniques used to minimize short term construction impacts are standard procedures included in construction contracts. For example, traffic control measures will be included in the construction contract to safely maintain traffic during construction activities.

Allowable work hours are controlled by local ordinances in order to mitigate impacts related to increased noise levels during construction.

Soil Erosion and Sedimentation Control

Soil Erosion and Sedimentation Control (SESC) plans and permit requirements are included in the construction contract as well. SESC measures include the use of inlet filters for catch basins within the project influence area to prevent soils or other construction materials from entering the

combined sewer system. Silt fences may also be used to prevent runoff from carrying soils from the construction site and potentially entering waterways.

Where feasible, trenchless technologies will be used to perform rehabilitation and limit required excavation. However, where trenchless rehabilitation methods cannot accomplish the necessary rehabilitation, open cut excavation will be required. For all excavated areas, it will be necessary for the contractor to stockpile excavated and backfill materials. During open cut operations, effort will be made to minimize the amount of open trench by backfilling as soon as possible after work is complete. This practice will minimize the amount of material stockpiled on the site, thereby minimizing the potential for sedimentation runoff and airborne particulate/dust problems. All excess soils will be removed from the project site as the work progresses.

The contractor will be required to maintain a safe and clean work site. This includes performing street sweeping as necessary during construction.

Existing Landscape

Any surface features impacted by the construction such as paved surfaces, lawns, or vegetation will be repaired or replaced as part of the construction contract.

Existing Underground Utilities

It is common to encounter existing utilities during excavation. Existing underground utilities that may be encountered include, but are not limited to, electric, gas, communications, water mains, and sewers. Every effort will be made to obtain information regarding underground utilities from all utility owners for inclusion on the construction plans. The contractor will be required to have all construction sites staked by MISS DIG for the location of all underground utilities. It will be the contractor's responsibility to protect all underground utilities during construction.

Culturally and Historically Significant Sites

Per the direction of the State Historical Preservation Office (SHPO), any culturally or historically significant artifacts that are uncovered during excavation require all work to be stopped and the area where the artifact(s) were encountered will be immediately surveyed by SHPO or any of the Tribal Historical Preservation Officers (THPO) who may have stated, by written correspondence, that their tribe has had past influence in the City. If encountered, every effort will be made to accommodate and not disturb any cultural or historically significant artifacts. If necessary, the project will be redesigned to maintain historically significant properties. The proposed excavation is in areas of previously constructed wastewater infrastructure where the ground has been previously disturbed during original construction. Therefore, we anticipate that culturally or historically significant artifacts will not be encountered.

Natural Water Features

Construction is not expected to occur near wetlands, floodplains, surface waters or natural streams and rivers. Therefore, mitigation related to these features is not considered in this project plan.

Mitigation of Long-Term Impacts

Operational Impacts

The sewer separation project will not result in any operational impact whatsoever as these locations are confined to gravity sewers that do not require operational activities.

Mitigation of Indirect Impacts

The proposed projects do not involve the expansion of the sewer system or implementation of a new wastewater treatment facility. The proposed work will not have an effect on the rate of development, population density, zoning or land use. Therefore, no indirect impacts are foreseen as a part of this project.

Staging of Construction

Due to the varied locations of the proposed projects, staging of the construction will not provide any additional mitigation benefits.

Public Participation

Public Meeting

A public meeting will be held at Mount Clemens City Hall on Monday, April 20, 2026. The following items will be discussed.

1. A description of the combined sewer separation and North Rose sanitary pump station replacement, including the purpose of the project and the problems it is intended to address.
2. A description of the recommended alternative, including its capital costs and a cost breakdown by project components (e.g., pump station upgrades, sewer system).
3. A discussion of project financing and costs to users, including the proposed method of project financing and estimated monthly debt retirement; the proposed annual, quarterly, or monthly charge to the typical residential customer; and any special fees that will be assessed.
4. A description of the anticipated social and environmental impacts associated with the recommended alternative and the measures that will be taken to mitigate adverse impacts.

Public Meeting Advertisement

In accordance with the Project Planning Document Preparation Guidance, the advertisement was published on the City's website on Thursday, April 2, 2026 and available in City Hall. The public meeting advertisement is included in Appendix L.

Public Meeting Summary

The following elements from the public meeting are included in Appendix L:

- Summary of the meeting held and what was covered during the meeting in the form of a presentation.
- List of attendees.
- Concerns raised during the meeting and the responses.
- Written comments received during the public notice period and the responses.
- Changes made to the project because of public comment.

Adoption of the Project Planning Document

The resolution to adopt this Project Plan passed at the April 20, 2026 City Commission meeting is included in Appendix M.

Technical Considerations

The projects included in this project plan are intended to address previously identified combined sewer areas. Therefore, infiltration and inflow (I&I) removal was not considered as part of this analysis. Similarly, a sewer system evaluation survey (SSES) was not conducted as part of this analysis.

Structural Integrity

A table summarizing the results of the NASSCO PACP sewer video inspection is included in Appendix I.

Appendix A

Maps of Service Area with Proposed Projects Locations

N

W E

S

ROSEBUD

ROSEPETAL

CHRISTINE

MARK

CARLSON

PARNACOTT

ELLWOOD

W1

GROESBECK

LAFAYETTE

ROSEVIEW

W9

W2

ALTER

W8

VALLEY

ROSE

Combined Sewer
Force Main
Sanitary Interceptor
Sanitary Sewer
Storm Sewer

Catch Basin
Combined Manhole
Junction Chamber
Sanitary Manhole
Storm Manhole

N Rose Pump station
Pump Stations
Combined Sewer Area

ANDERSON, ECKSTEIN AND WESTRICK, INC.
CIVIL ENGINEERS SURVEYORS ARCHITECTS
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www.aewinc.com

DATE PRINTED: 2/5/2026	DATE CREATED: 2/5/2026
SCALE: 1" = 100'	MAP DOCUMENT: N Rose Pump Station.mxd
PROJECT NO: 0220-0269	CREATED BY: AEK / CHECKED BY: AMC

City of Mount Clemens

N Rose Pump Service Area

REFERENCE SHEET NUMBER
Map

CAUTION

THIS MAP IS INTENDED FOR REFERENCE PURPOSES ONLY

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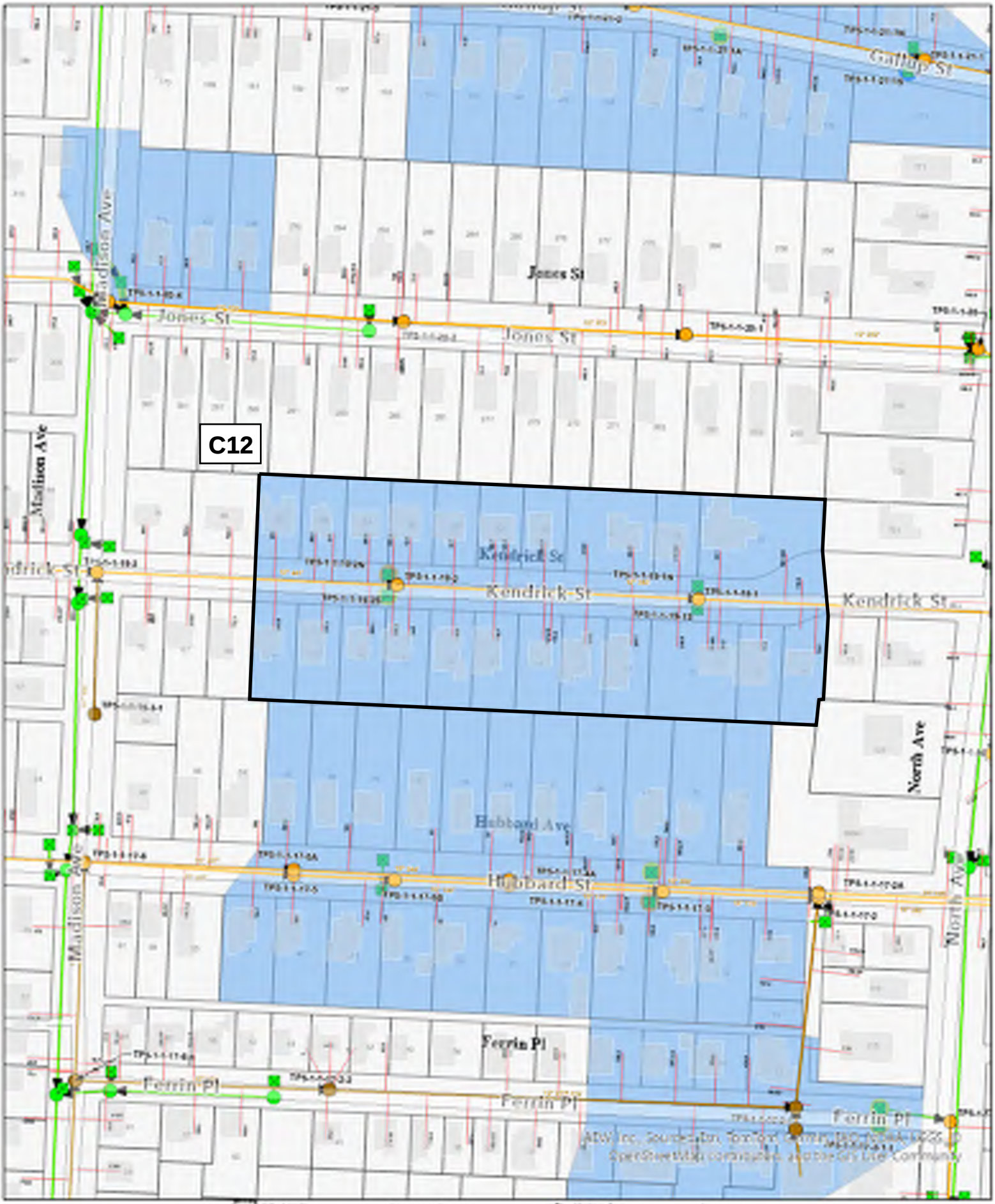
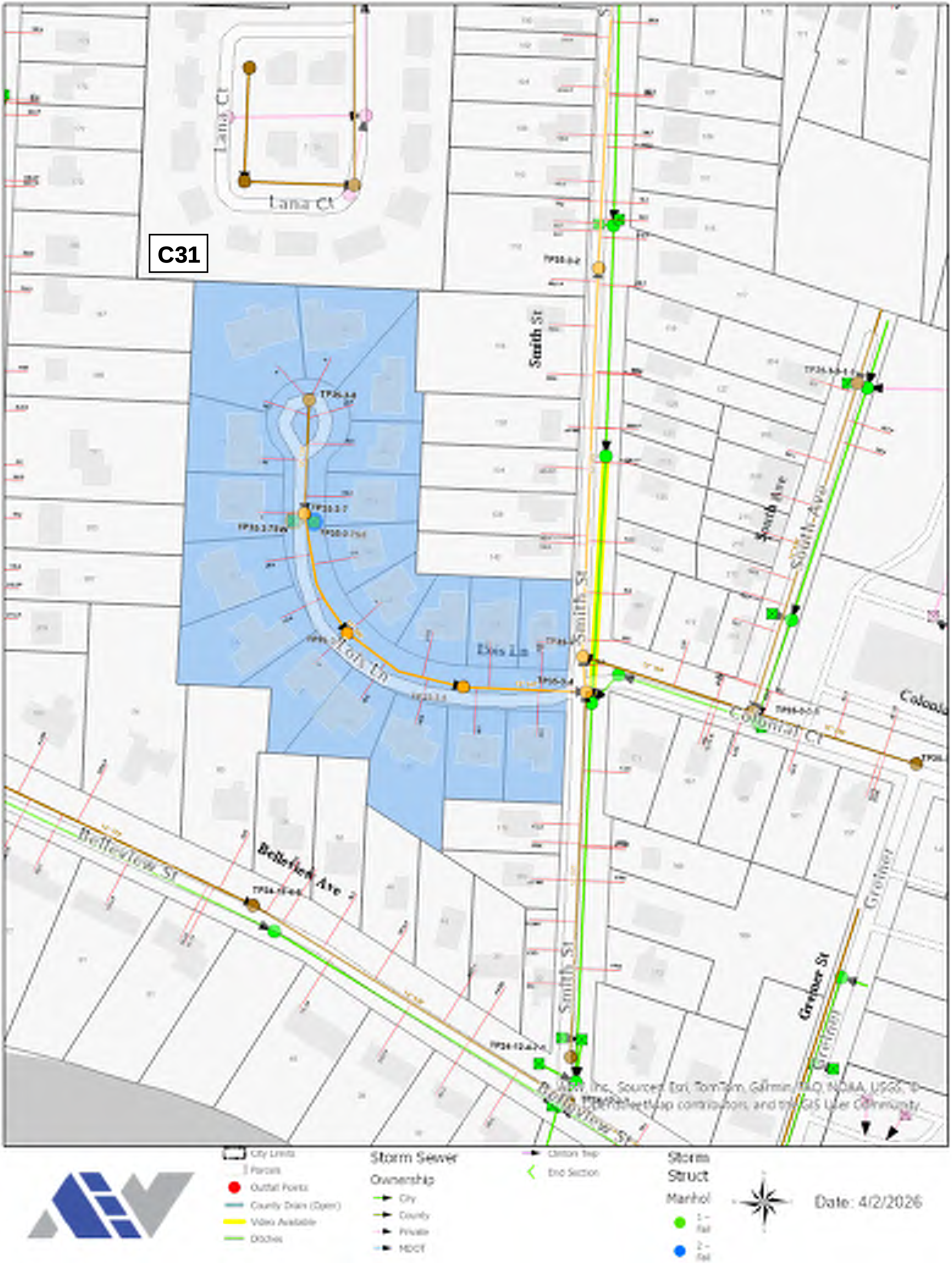
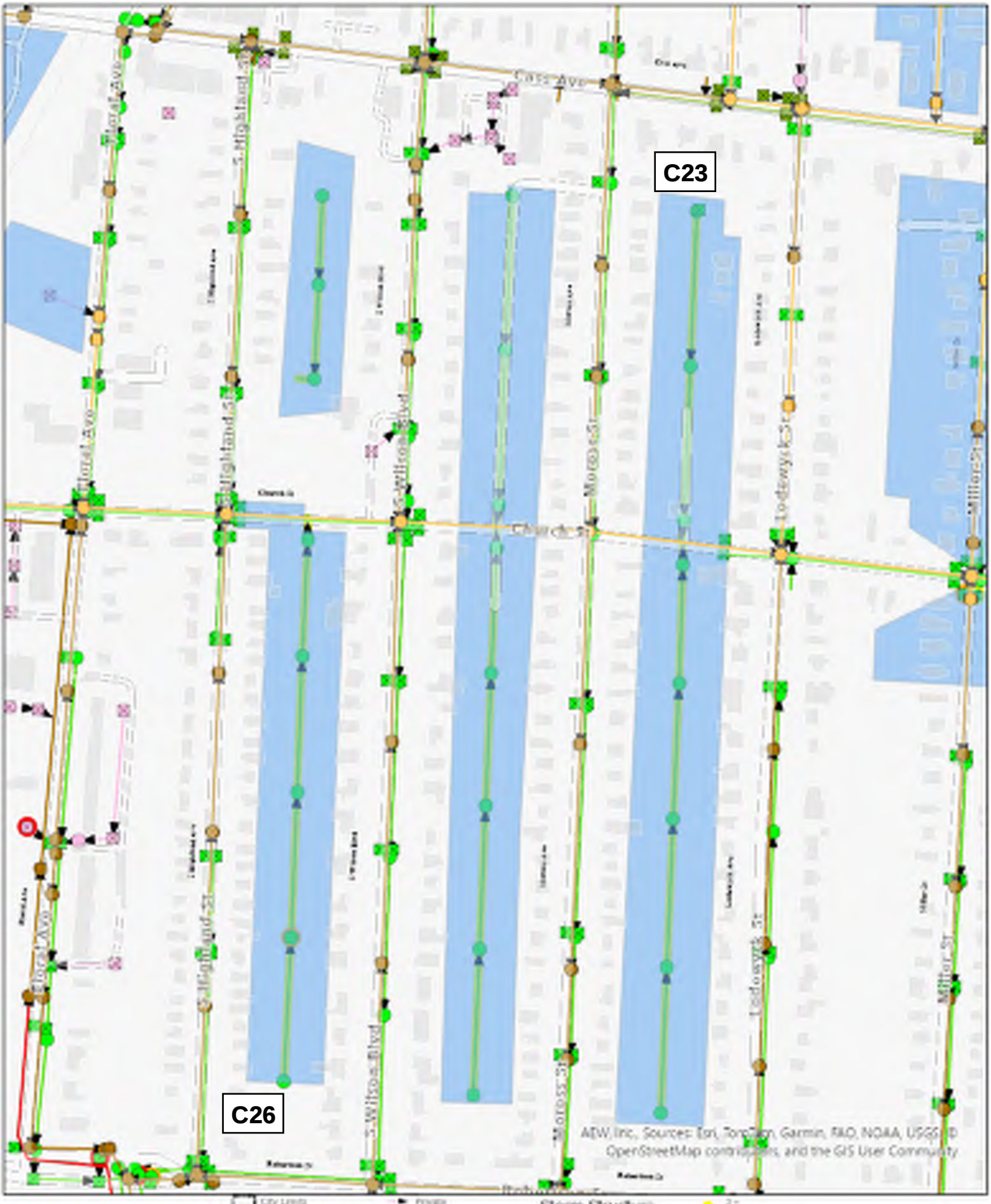

C12
Jones St
Kendrick St
Hubbard Ave
Ferrin Pl
Madison Ave
North Ave
City Limits
Parcels
Outfall Points
County Drain (Open)
Video Available
Ditches
Storm Sewer
Ownership
City
County
Private
MDOT
Clinton Twp
End Section
Storm
Struct
Manhole
Date: 4/2/2026


C31
Lana Ct
Smith St
Lois Ln
Colonial Ct
South Ave
Belleview St
Belleview Ave
Greiner St
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
City Limits
Parcels
Outfall Points
County Drain (Open)
Video Available
Ditches
Storm Sewer
Ownership
City
County
Private
MDOT
End Section
Storm
Struct
Manhol
1 - Fail
2 - Fail
Date: 4/2/2026


C23
C26
Clark Ave
Floral Ave
S Highland St
S Wilcox Blvd
Morgan St
Lodewyck St
Miller St
Church St
AEW, Inc., Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
City Limits
Video Available
Storm Sewer
Ownership
City
County
Private
MDOT
Clinton Twp
Storm Structure Condition Rating
Manhole Rating
1 – Failure unlikely (Excellent)
2 – Failure unlikely in 20 years (Good)
2 – Fair
4 – Poor
5 – Failing
Date: 4/2/2026

Appendix B

SEMCOG Community Profile

City of Mount Clemens Profile

4

Square Miles

15,697

Total Population (2020)

1 Crocker Blvd., Mt. Clemens, MI 48043

http://www.cityofmountclemens.com/

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Go to: Community Explorer Map | 2020 Census Map | Demographic Emphasis Areas Map

People | Economy and Jobs | Housing | Transportation | Environment and Land Use

Population and Households

Reports and Resources:

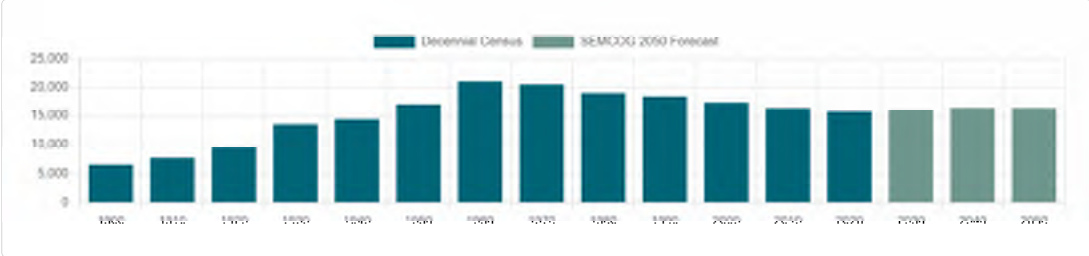
Population and Household Estimates Southeast Michigan, 2025

Historic Population and Employment by Minor Civil Division, Southeast Michigan

American Community Survey (ACS) Websites:

2020-2024 Social Demographic

Population Forecast



Population and Households

Population And Households	Census 2020	Census 2010	Change 2010-2020	Percent Change 2010-2020	SEMCOG Jul 2025	SEMCOG 2050
Total Population	15,697	16,314	-617	-3.8%	15,917	16,345
Group Quarters Population	838	1,584	-746	-47.1%	1,307	1,641
Household Population	14,859	14,730	129	0.9%	14,610	14,704
Housing Units	7,432	7,582	-150	-2.0%	7,495	-
Households (Occupied Units)	6,982	6,714	268	4.0%	7,070	7,259
Residential Vacancy Rate	6.1%	11.4%	-5.4%	-	5.7%	-
Average Household Size	2.13	2.19	-0.07	-	2.07	2.03

Components of Population Change

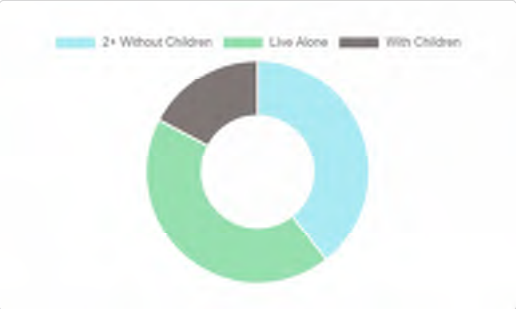
Components Of Population Change	2010-2020 Avg	2020-2023 Avg
Natural Increase (Births - Deaths)	-10	-82
Births	185	137
Deaths	195	219

Net Migration (Movement In - Movement Out)	-51	133
Population Change (Natural Increase + Net Migration)	-62	50

Household Types

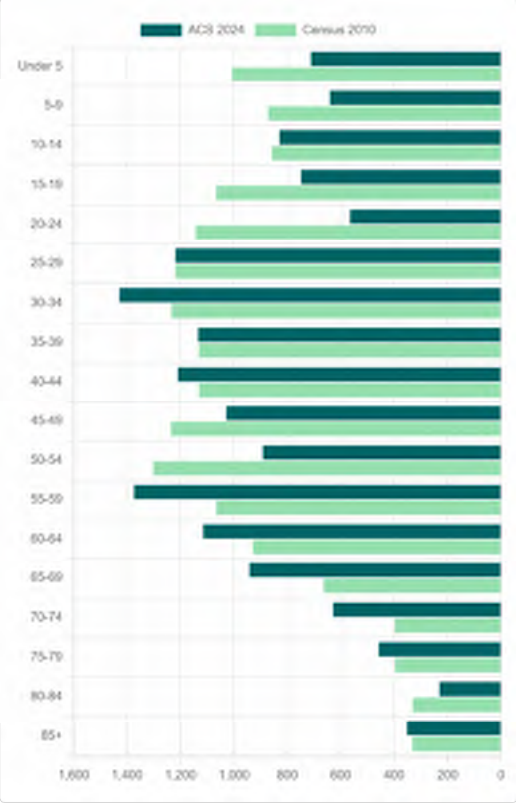
ACS 2024

SEMCOG 2050



Household Types	Census 2010	ACS 2024	Change 2010-2024	Percent Change 2010-2024	SEMCOG 2050
With Seniors 65+	1,626	2,007	381	23.4%	2,912
Without Seniors	5,088	4,776	-312	-6.1%	4,347
Live Alone, 65+	872	1,081	209	24.0%	-
Live Alone, < 65:	1,793	1,559	-234	-13.1%	-
2+ Persons, with Children	1,739	1,444	-295	-17.0%	1,254
2+ Persons, without Chil...	2,310	2,699	389	16.8%	2,866
Total Households	6,714	6,783	69	1.0%	7,259

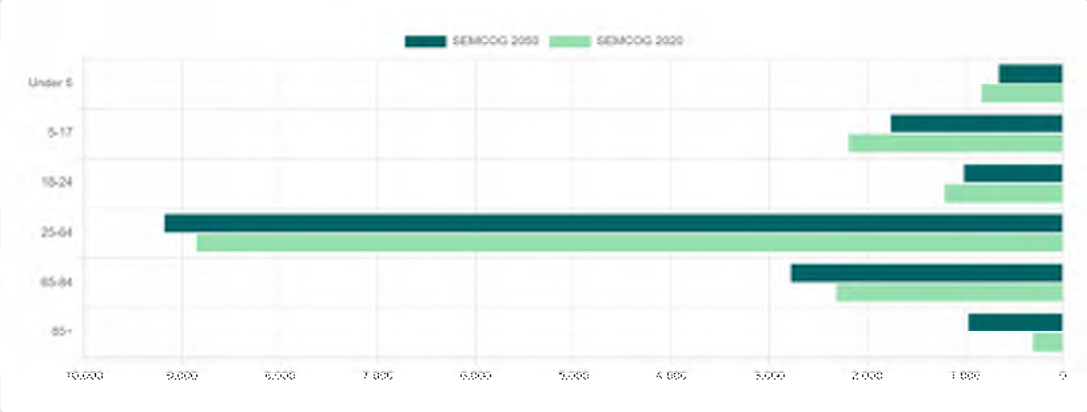
Population Change by Age, 2010-2024



Age Group	Census 2010	Change 2000-2010	ACS 2024	Change 2010-2024
Under 5	1,007	-103	712	-295
5-9	872	-202	641	-231
10-14	858	-104	830	-28
15-19	1,067	75	749	-318
20-24	1,143	-15	565	-578
25-29	1,219	-218	1,219	0

30-34	1,234	-279	1,429	195
35-39	1,131	-404	1,134	3
40-44	1,131	-327	1,210	79
45-49	1,235	-67	1,029	-206
50-54	1,302	196	892	-410
55-59	1,066	268	1,374	308
60-64	929	384	1,115	186
65-69	664	118	942	278
70-74	397	-198	629	232
75-79	396	-111	458	62
80-84	331	-34	231	-100
85+	332	23	352	20
Total	16,314	-998	15,511	-803
Median A...	38.3	1.9	42.0	3.7

Forecasted Population Change 2020-2050



Age Group	2020	2025	2030	2035	2040	2045	2050	Change 2020-2050	Percent Change 2020-2050
Under 5	831	785	755	712	735	717	654	-177	-21.3%
5-17	2,187	1,978	1,901	1,821	1,784	1,779	1,758	-429	-19.6%
18-24	1,206	1,158	1,102	1,101	999	976	1,010	-196	-16.3%
25-64	8,853	8,882	8,981	9,033	9,136	9,231	9,181	328	3.7%
65-84	2,316	2,681	2,797	2,927	2,985	2,918	2,779	463	20.0%
85+	304	339	443	601	734	887	963	659	216.8%
Total	15,697	15,823	15,979	16,195	16,373	16,508	16,345	648	4.1%

Older Adults and Youth Populations

Older Adults And Youth Population	Census 2010	ACS 2024	Change 2010-2024	Percent Change 2010-2024	SEMCOG 2050
65 and over	2,120	2,612	492	23.2%	3,742
65 to 84	1,788	2,260	472	26.4%	2,779
85 and Over	332	352	20	6.0%	963
Under 18	3,353	2,650	-703	-21.0%	2,412
5 to 17	2,346	1,938	-408	-17.4%	1,758
Under 5	1,007	712	-295	-29.3%	654

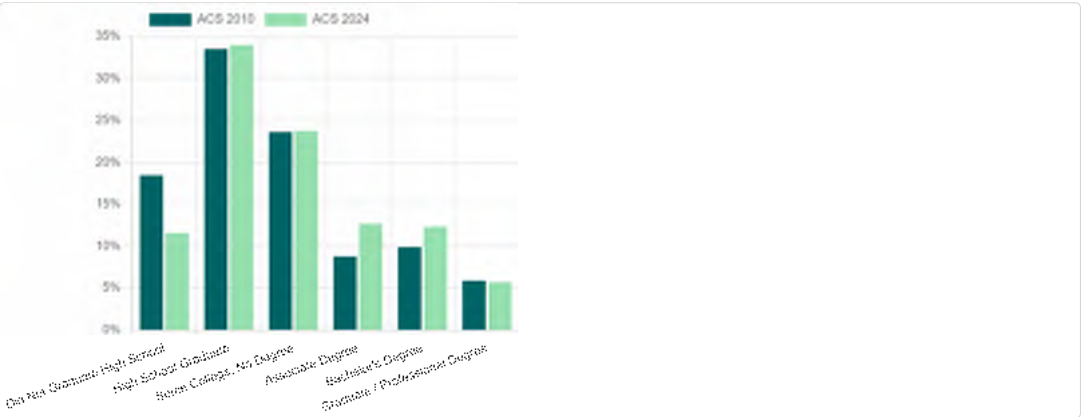
Race and Hispanic Origin

Race and Hispanic Origin	Census 2010	Percent Of Population 2010	ACS 2024	Percent of Population 2024	Percent Change 2010-2024
Non-Hispanic	15,837	97.1%	14,895	96.0%	-1.0%
White	11,150	68.3%	10,118	65.2%	-3.1%
Black	3,993	24.5%	3,098	20.0%	-4.5%

Asian	79	0.5%	46	0.3%	-0.2%
Multi-Racial	533	3.3%	1,531	9.9%	6.6%
Other	82	0.5%	75	0.5%	0.0%
Hispanic	477	2.9%	616	4.0%	1.0%
Total	16,314	100.0%	15,511	100.0%	0.0%

Highest Level of Education

Highest Level Of Education	ACS 2010	ACS 2024	Percent Change 2010-2024
Did Not Graduate High S...	18.4%	11.6%	-6.8%
High School Graduate	33.5%	34.0%	0.5%
Some College, No Degree	23.6%	23.8%	0.2%
Associate Degree	8.7%	12.7%	4.0%
Bachelor's Degree	9.9%	12.3%	2.4%
Graduate / Professional ...	5.8%	5.7%	-0.2%



SEMCOG Homepage

City of Mount Clemens Profile

4

Square Miles

15,697

Total Population (2020)

1 Crocker Blvd., Mt. Clemens, MI 48043

http://www.cityofmountclemens.com/

Go to: Community Explorer Map | 2020 Census Map | Demographic Emphasis Areas Map

People | Economy and Jobs | Housing | Transportation | Environment and Land Use

Economy and Jobs

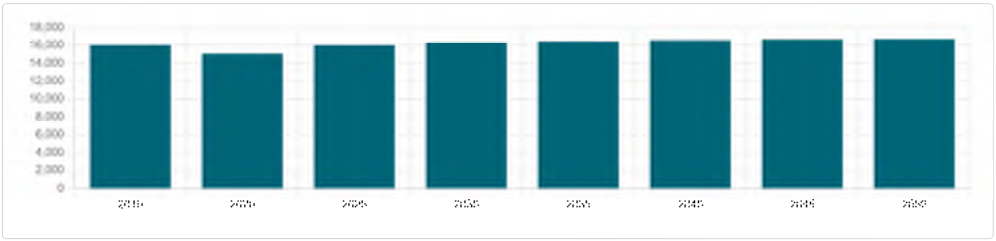
Reports and Resources:

Historic Population and Employment by Minor Civil Division, Southeast Michigan

American Community Survey (ACS) Website:

2020-2024 Economic

Forecasted Jobs

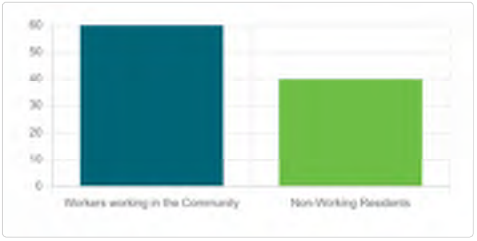


Forecasted Jobs by Industry Sector

Forecasted Jobs by Industry Sector	2019	2020	2025	2030	2035	2040	2045	2050	Change 2019-2050	
Natural Resources, Mining, & Construction	930	854	971	1,020	1,027	1,031	1,032	1,041	111	11
Manufacturing	1,469	1,274	1,473	1,454	1,459	1,388	1,325	1,316	-153	-10
Wholesale Trade	258	232	248	230	225	224	218	224	-34	-13
Retail Trade	721	682	735	657	647	641	621	595	-126	-17
Transportation, Warehousing, & Utilities	528	510	617	645	658	651	654	648	120	22
Information & Financial Activities	1,116	1,065	1,072	1,107	1,107	1,130	1,114	1,098	-18	-1.
Professional and Technical Services & Corporate HQ	844	811	848	885	899	927	953	955	111	13
Administrative, Support, & Waste Services	708	638	686	719	747	774	793	817	109	15
Education Services	569	538	566	538	550	560	559	558	-11	-1.
Healthcare Services	4,369	4,259	4,352	4,493	4,591	4,636	4,760	4,831	462	10
Leisure & Hospitality	839	640	789	869	870	892	918	920	81	9.7
Other Services	911	859	867	877	899	911	912	916	5	0.5
Public Administration	2,765	2,701	2,781	2,808	2,817	2,831	2,824	2,813	48	1.7
Total Employment Numbers	16,027	15,063	16,005	16,302	16,496	16,596	16,683	16,732	705	4.4

Daytime Population

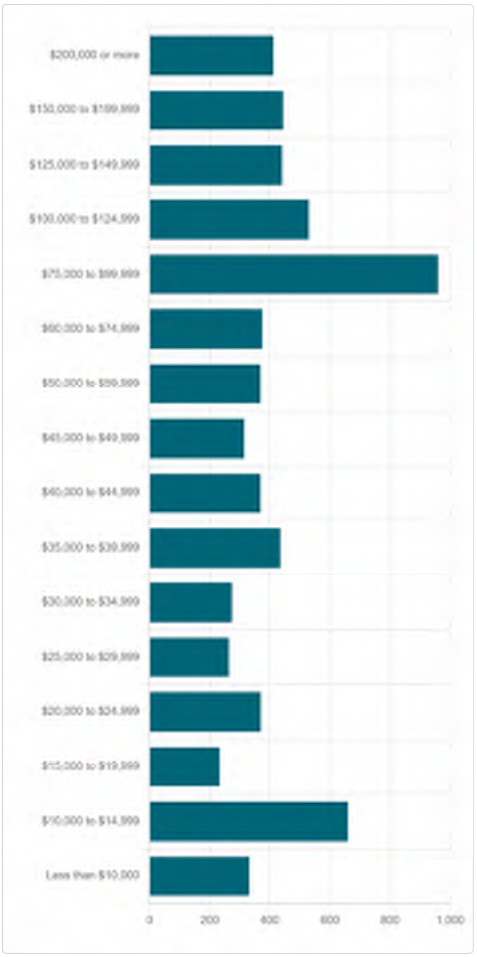
Daytime Population (ACS 2024)	Population
Workers working in the Community	12,160
Non-Working Residents	8,106
Age 15 and under	2,341
Not in labor force	5,228
Unemployed	537
Daytime Population	20,266



Household Income

Income (in 2024 dollars)	ACS 2010	ACS	Change 2010-2024	Percent Change 2010-2024
Median Household Income	$44,922	$52,310	$7,388	16.4%
Per Capita Income	$30,254	$35,984	$5,730	18.9%

Annual Household Income



Annual Household Income (ACS 2024)	Households
$200,000 or more	412
$150,000 to $199,999	444
$125,000 to $149,999	441
$100,000 to $124,999	530
$75,000 to $99,999	960
$60,000 to $74,999	375
$50,000 to $59,999	369
$45,000 to $49,999	315
$40,000 to $44,999	369
$35,000 to $39,999	435
$30,000 to $34,999	274
$25,000 to $29,999	264
$20,000 to $24,999	370
$15,000 to $19,999	233
$10,000 to $14,999	660
Less than $10,000	332
Total	6,783

Poverty

Poverty	Census 2010	Percent Of Total 2010	ACS 2024	Percent of Total 2024	Percent Change 2010-2024
Persons in Poverty	3,139	21.5%	2,340	16.3%	-5.1%
Households in Poverty	1,438	21.4%	1,169	17.2%	-4.2%

City of Mount Clemens Profile

4

Square Miles

15,697

Total Population (2020)

1 Crocker Blvd., Mt. Clemens, MI 48043

http://www.cityofmountclemens.com/

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Housing

Reports and Resources:

Population and Household Estimates Southeast Michigan, 2025

American Community Survey (ACS) Website:

2020-2024 Housing

Building Permits 2010-2025

Year	Single Family	Two Family	Attach Condo	Multi-Family	Total Units	Total Demos	Net Total
2010	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0
2012	0	0	0	0	0	6	-6
2013	0	0	0	0	0	2	-2
2014	0	0	0	0	0	1	-1
2015	1	0	0	0	1	1	0
2016	1	0	0	0	1	0	1
2017	2	0	0	0	2	5	-3
2018	5	0	0	0	5	0	5
2019	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0
2021	1	0	0	30	31	22	9
2022	0	0	0	0	0	1	-1
2023	0	0	0	0	0	1	-1
2024	1	0	0	0	1	1	0
2025	5	0	0	0	5	1	4
2010 to 2025 tot...	16	0	0	30	46	41	5

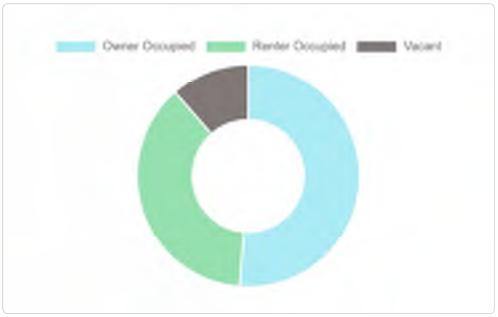
Housing Types

Housing Type	ACS 2010	ACS 2024	Change 2010-2024	New Units Permitted Since 2024
Single Unit	4,477	4,317	-160	5
Multi-Unit	3,446	2,685	-761	0
Mobile Homes or Other	168	164	-4	0
Total	8,091	7,166	-925	5
Units Demolished				-1

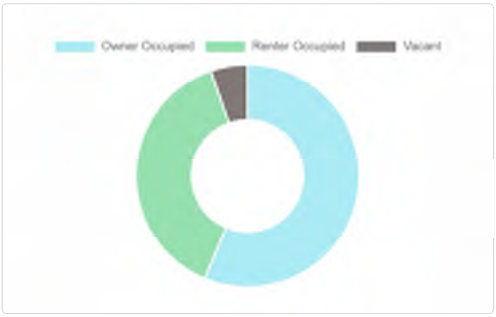
Housing Tenure

Housing Tenure	Census 2010	ACS 2024	Change 2010-2024
Owner Occupied	3,886	4,032	146
Renter Occupied	2,828	2,751	-77
Vacant	868	383	-485
Seasonal/Migrant	15	12	-3
Other Vacant Units	853	371	-482
Total Housing Units	7,582	7,166	-416

Census 2010



ACS 2024



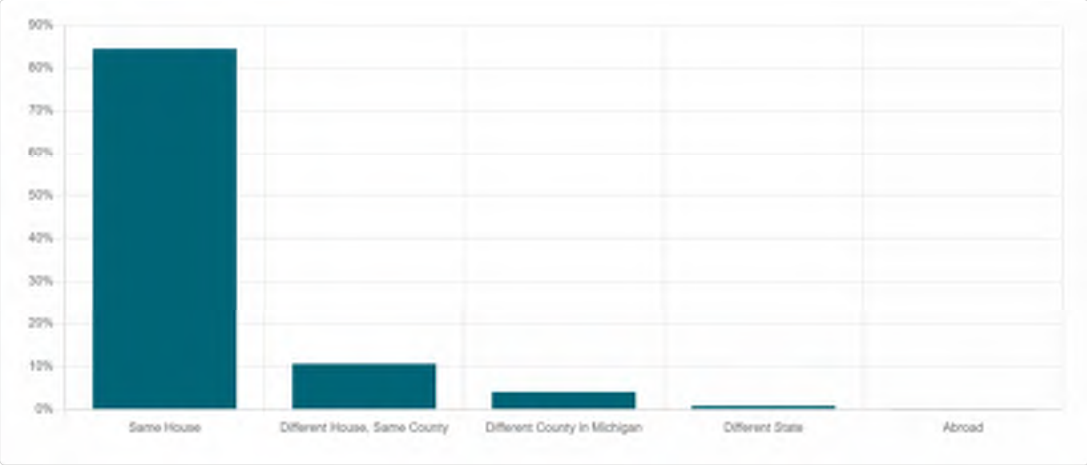
Housing Value and Rent

Housing Value (in 2024 dollars)	ACS 2010	ACS	Change 2010-2024	Percent Change 2010-2024
Median housing value	$185,806	$179,400	-$6,406	-3.4%
Median gross rent	$838	$847	$9	1.1%

Housing Value

$1,000,000 or more	23
$500,000 to $999,999	36
$300,000 to $499,999	430
$250,000 to $299,999	330
$200,000 to $249,999	747
$175,000 to $199,999	545
$150,000 to $174,999	714
$125,000 to $149,999	373
$100,000 to $124,999	269
$80,000 to $99,999	251
$60,000 to $79,999	94
$40,000 to $59,999	122
$30,000 to $39,999	20
$20,000 to $29,999	28
$10,000 to $19,999	12
Less than $10,000	38
Owner-Occupied Units	4,032

Residence One Year Ago



City of Mount Clemens Profile

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Transportation

Miles of Public Road

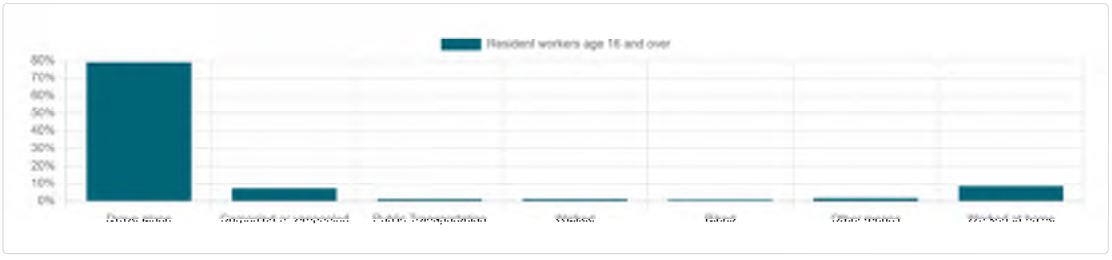
Type	Miles
Miles of public road (including boundary roads)	65.0

Pavement Condition (in Lane Miles)

Past Pavement Conditions 2021

Current Pavement Conditions 2023-2024

Transportation to Work, 2024



Transportation to Work	ACS 2010	Percent Of Total ACS 2010	ACS 2024	Percent of Total ACS 2024	Percentage Point Change 2010-2024
Drove alo...	5,247	85.5%	5,726	79.2%	-6.3%

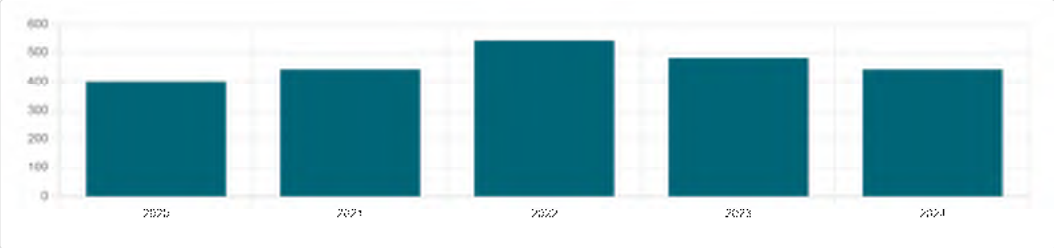
Carpoole...	563	9.2%	516	7.1%	-2.0%
Public Tra...	92	1.5%	93	1.3%	-0.2%
Walked	92	1.5%	91	1.3%	-0.2%
Biked	20	0.3%	65	0.9%	0.6%
Other me...	0	N/A	131	1.8%	1.8%
Worked at...	122	2.0%	611	8.4%	6.5%
Resident ...	6,136	100.0%	7,233	100.0%	N/A

Mean Travel Time to Work

Mean Travel Time To Work	ACS 2010	ACS 2024	Change 2010-2024
For reside...	23.4 minu...	26.5 minu...	3.1 minutes

Crash Data

Crashes, 2020-2024



Crash Severity

Crash Severity	2020	2021	2022	2023	2024	Change From 2020-2024	Percent Of Crashes 2020-2024
Fatal	1	3	1	1	3	200.0%	0.4%
Serious in...	10	6	9	3	4	-60.0%	1.4%
Other inj...	88	118	116	113	106	20.5%	23.4%
Property ...	303	316	419	365	330	8.9%	74.9%
Total cras...	402	443	545	482	443	10.2%	100.0%

Crashes by Type

Crashes By Type	2020	2021	2022	2023	2024	Change From 2020-2024	Percent Of Crashes 2020-2024
Head-on	8	14	3	6	7	-12.5%	1.6%
Angle or ...	103	99	117	113	100	-2.9%	23.0%
Rear-end	113	137	153	102	104	-8.0%	26.3%
Sideswipe	80	103	153	120	100	25.0%	24.0%
Single Ve...	50	48	45	51	41	-18.0%	10.2%
Backing	23	20	25	25	19	-17.4%	4.8%
Other or ...	25	22	49	65	72	188.0%	10.1%

Crashes by Involvement

Crashes By Involvement	2020	2021	2022	2023	2024	Change From 2020-2024	Percent Of Crashes 2020-2024
Red-light ...	10	6	7	18	21	110.0%	2.7%
Lane Dep...	54	44	63	55	46	-14.8%	11.3%
Alcohol	19	33	26	22	20	5.3%	5.2%
Drugs	8	8	6	4	2	-75.0%	1.2%
Deer	1	1	2	1	2	100.0%	0.3%

Train	0	0	0	0	0	N/A	N/A
Commerc...	18	26	30	28	21	16.7%	5.3%
School Bus	2	3	5	0	1	-50.0%	0.5%
Emergen...	4	5	4	5	10	150.0%	1.2%
Motorcyc...	8	2	8	4	5	-37.5%	1.2%
Intersecti...	172	213	192	208	165	-4.1%	41.0%
Work Zone	1	3	6	13	3	200.0%	1.1%
Pedestrian	5	6	5	8	5	N/A	1.3%
Bicyclist	1	8	4	5	8	700.0%	1.1%
Older Dri...	81	87	108	113	98	21.0%	21.0%
Young Dri...	64	54	81	59	48	-25.0%	13.2%
Distracte...	40	62	80	61	41	2.5%	12.3%
Driveway	41	39	40	37	21	-48.8%	7.7%
Speeding	19	15	14	6	11	-42.1%	2.8%
Unbelted	8	13	9	7	8	N/A	1.9%
Secondary	6	34	4	2	1	-83.3%	2.0%

High Frequency Intersections

Filters

Ranked by 2020-2024 Five-Year Fatalities and Serious Injuries

Local Rank	County Rank	Region Rank	Intersection	Jurisdiction	Avg. 2(
1	47	296	Groesbeck Hwy N @ Eliz...	State,County	
2	133	716	Groesbeck Hwy N @ Hu...	State,City/Village	
2	133	716	Cass Ave @ Groesbeck H...	State,County	
2	133	716	Gratiot Ave N @ Roberts...	State,City/Village	
2	133	716	Crocker Blvd @ Harper A...	County,City/Village	
6	295	1887	Dunham Rd @ Rose St N	County,City/Village	
6	295	1887	North Ave @ Huron Ave	County	
6	295	1887	Gratiot Ave S @ Huron A...	State	
6	295	1887	Gratiot Ave @ Clair Ave	State,County,City/Village	
6	295	1887	Groesbeck Hwy N @ Ros...	State,City/Village	
6	295	1887	Hubbard Ave @ Grove P...	City/Village	
6	295	1887	Gratiot Ave S @ Main St	State,Private/Other	
6	295	1887	Gratiot Ave S @ Market St	State,City/Village	
6	295	1887	Grand Ave @ Grove Park...		
6	295	1887	Gratiot Ave S @ North A...	State,City/Village	
6	295	1887	Cass Ave @ Rose St N	County,City/Village	
6	295	1887	Gratiot Ave N @ River R...	State,City/Village	
6	295	1887	Cass Ave @ Gratiot Ave S	State,County	
6	295	1887	Dickinson St @ 1st St	City/Village	
6	295	1887	Cass Ave @ Gratiot Ave N	State,City/Village	
6	295	1887	Groesbeck Hwy S @ Chu...	State,City/Village	
6	295	1887	Gratiot Ave N @ Church ...	State,City/Village	
6	295	1887	Gratiot Ave N @ Clinton ...	State	
6	295	1887	Gratiot Ave N @ Kibbee ...	State	
6	295	1887	Gratiot Ave S @ Harringt...	State,County,City/Village	
6	295	1887	Gratiot Ave S @ Iroquois...	State	
6	295	1887	Cass Ave @ Floral Ave		
6	295	1887	↳ Cass Ave @ Floral Ave	County	
6	295	1887	Main St @ Gratiot Ave N		

6	295	1887	↳ Main St @ Main St N	City/Village

High Frequency Road Segments

Filters

Ranked by 2020-2024 Five-Year Fatalities and Serious Injuries

Local Rank	County Rank	Region Rank	Road Name	From Road - To Road	Jurisdiction
1	42	251	Groesbeck Hwy N	Cass Ave - Hubbard Ave	State
2	116	691	Gratiot Ave S	Metropolitan Pkwy - Harr...	State
2	116	691	Gratiot Ave S	Clair Ave - Gratiot Ave	State
2	116	691	North Ave	Elizabeth St - Groesbeck ...	County
5	210	1304	Crocker Blvd	Gratiot Ave N - Harper Ave	City/Village
5	210	1304	Gratiot Ave N	Wellington Cres - Robert...	State
5	210	1304	Gratiot Ave S	Cass Ave - North Ave	State
5	210	1304	Groesbeck Hwy N	Rose St N - Elizabeth Rd	State
5	210	1304	Groesbeck Hwy S	Church St - Cass Ave	State
5	210	1304	Harper Ave	Wellington Cres - Crocke...	County
5	210	1304	Henry B Joy Blvd	Gratiot Ave - W I 94	County
12	406	2611	Cass Ave	Rose St N - Gratiot Ave S	County
12	406	2611	Church St	Groesbeck Hwy S - Rose ...	City/Village
12	406	2611	Dickinson St	Rathbone St - Gratiot Av...	City/Village
12	406	2611	Dunham Rd	Rose St N - Elizabeth Rd	County
12	406	2611	Elizabeth Rd	Dunham Rd - Groesbeck ...	County
12	406	2611	Gratiot Ave N	Robertson St - Church St	State
12	406	2611	Gratiot Ave N	Church St - Cass Ave	State
12	406	2611	Gratiot Ave N	Cass Ave - Market St	State
12	406	2611	Gratiot Ave N	River Rd N - Gratiot/River...	State
12	406	2611	Gratiot Ave S	Church St - Cass Ave	State
12	406	2611	Gratiot Ave S	Welts St - Clair Ave	State
12	406	2611	Groesbeck Hwy S	Harrington St - Church St	State
12	406	2611	Hubbard Ave	Rose St N - North Ave	City/Village
12	406	2611	Market St	Gratiot Ave S - Hubbard ...	City/Village
12	406	2611	River Rd N	Gratiot/River Cutoff - W I...	City/Village
12	406	2611	Rose St N	Hubbard Ave - Groesbec...	City/Village
12	406	2611	Rose St S	Church St - Cass Ave	City/Village

City of Mount Clemens Profile

4

Square Miles

15,697

Total Population (2020)

1 Crocker Blvd., Mt. Clemens, MI 48043

http://www.cityofmountclemens.com/

Powered by Esri

Go to: Community Explorer Map | 2020 Census Map | Demographic Emphasis Areas Map

People | Economy and Jobs | Housing | Transportation | Environment and Land Use

Environment and Land Use

2020 Land Use

Parcel Land Use	Acres 2015	Acres 2020	Change 2015–2020	Percent Change 2015–2020
Single-Family Residential	907.3	888.1	-19.2	-2.1%
Attached Condo Housing	34.0	34.0	0	N/A
Multi-Family Housing	67.0	87.3	20.3	30.3%
Mobile Home	17.0	17.0	0	N/A
Agricultural/Rural Residential	10.9	0	-10.9	-100.0%
Mixed Use	0.3	3.1	2.8	893.7%
Retail	165.6	151.8	-13.8	-8.3%
Office	76.6	71.8	-4.8	-6.3%
Hospitality	16.3	20.4	4.1	24.9%
Medical	24.7	51.5	26.8	108.6%
Institutional	177.3	132.8	-44.5	-25.1%
Industrial	264.6	233.9	-30.7	-11.6%
Recreational/Open Space	86.8	92.3	5.5	6.3%
Cemetery	0	0	0	N/A
Golf Course	0	0	0	N/A
Parking	30.1	32.1	1.9	6.4%
Extractive	0	0	0	N/A
TCU	87.0	87.0	0	N/A
Vacant	163.4	227.8	64.4	39.4%
Water	72.9	72.9	0	N/A
Not Parceled	485.1	483.2	-1.8	-0.4%
Total	2,686.8	2,686.8	0.0	0.0%

2020 Land Cover

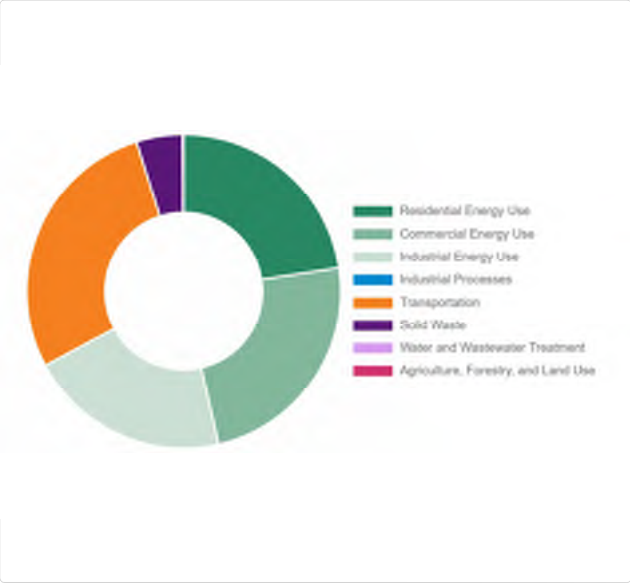
Type	Description	Acres	Percent
Impervious	buildings, roads, driveways, parking lots	1,269.2	47.2%
Trees	woody vegetation, trees	494.0	18.4%
Open Space	agricultural fields, grasslands, turfgrass	788.4	29.3%
Bare	soil, aggregate piles, unplanted fields	60.9	2.3%
Water	rivers, lakes, drains, ponds	74.1	2.8%
Total		2,686.6	100.0%

2022 Tree Canopy

Type	Acres	Percent
Tree Canopy	733.7	27.3%

2019 Greenhouse Gas Emissions

Type	CO2e (MT)	Percent Of Total
Residential Energy...	63,498.1	22.62%
Commercial Energ...	66,829.7	23.81%
Industrial Energy ...	58,168.0	20.72%
Industrial Processes	7.7	0.00%
Transportation	78,521.0	27.97%
Solid Waste	13,381.5	4.77%
Water and Wastew...	295.7	0.11%
Agriculture, Forest...	0	N/A
Total	280,701.7	100.00%

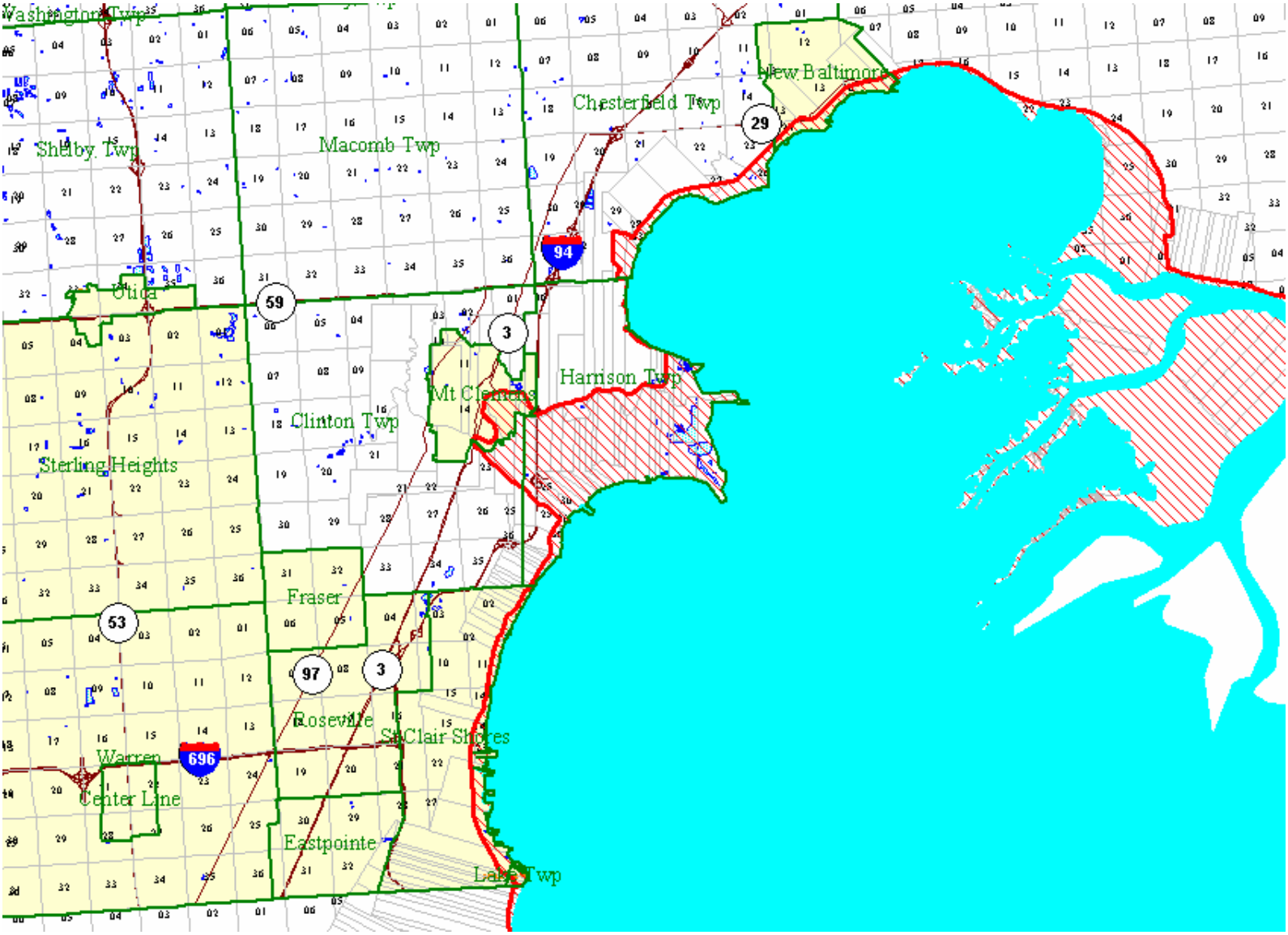


Appendix C

Great lakes Shorelands, Coastal Zones, and Coastal Management Areas

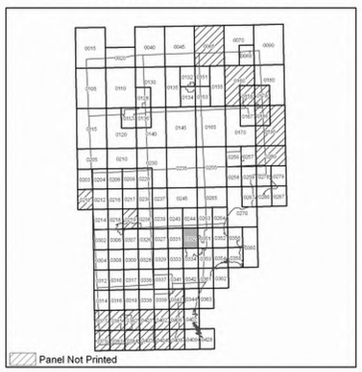
Macomb County
Chesterfield Township, T3N R14E
Harrison Township and Mt. Clemens, T2N R14E
Clinton Township, T2N R13E, T2N R14E
St. Clair Shores, T2N R13E, T1N R13E
Lake Township, T1N R13E

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



Appendix D

Flood and Wetland Maps



NOTES TO USERS

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

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

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

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

The **projection** used in the preparation of this map was Michigan State Plane South zone 6401 (FIPSZONE 2113). The **horizontal datum** was NAD83. Differences in datum, spheroid, projection or state plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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

Base Map information shown on this FIRM was provided in digital format by Macomb County Planning and GIS Mapping. This information was photogrammetrically compiled at a scale of 1:1200 feet from aerial photography dated 2000.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

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

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

PANEL INDEX

▨ Panel Not Printed

LEGEND

▨ SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100 year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard may include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

▨ FLOODWAY AREAS IN ZONE AE

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

▨ OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

☐ OTHER AREAS

ZONE X	Areas determined to be outside of the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

▨ COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

▨ OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

———	1% annual chance floodplain boundary
———	0.2% annual chance floodplain boundary
— — —	Floodway boundary
— — —	Zone D boundary
••••••••	CBRS and OPA boundary
▨ ←	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
~~ 513 ~~~~	Base Flood Elevation line and value; elevation in feet*
(EL 10)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

Ⓐ——Ⓐ	Cross section line
㉓- - - -㉓	Transect line
85° 03' 45.0", 41° 24' 22.5"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
$^{45}87^{000}$ M	1000-meter Universal Transverse Mercator grid values, zone 17
2250000 FT	5000-foot grid ticks: Michigan State Plane South Coordinate System, 6401 zone (FIPSZONE 2113), Lambert Conformal Conic projection
KA0015 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
SEPTEMBER 29, 2006

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0332G

FIRM

FLOOD INSURANCE RATE MAP

MACOMB COUNTY, MICHIGAN

(ALL JURISDICTIONS)

PANEL 332 OF 428
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLINTON, CHARTER TOWNSHIP OF	260121	0332	G
MOUNT CLEMENS, CITY OF	260124	0332	G

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

MAP NUMBER
26099C0332G

EFFECTIVE DATE
SEPTEMBER 29, 2006

Federal Emergency Management Agency

FLOOD HAZARD INFORMATION

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

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) *Zone A,V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS

- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- E 18.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

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

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

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Base map information shown on this FIRM was provided in digital format by the National Agriculture Imagery Program (NAIP). This information was derived from digital orthophotography at a 2-foot resolution from photography dated 2016.

SCALE

N

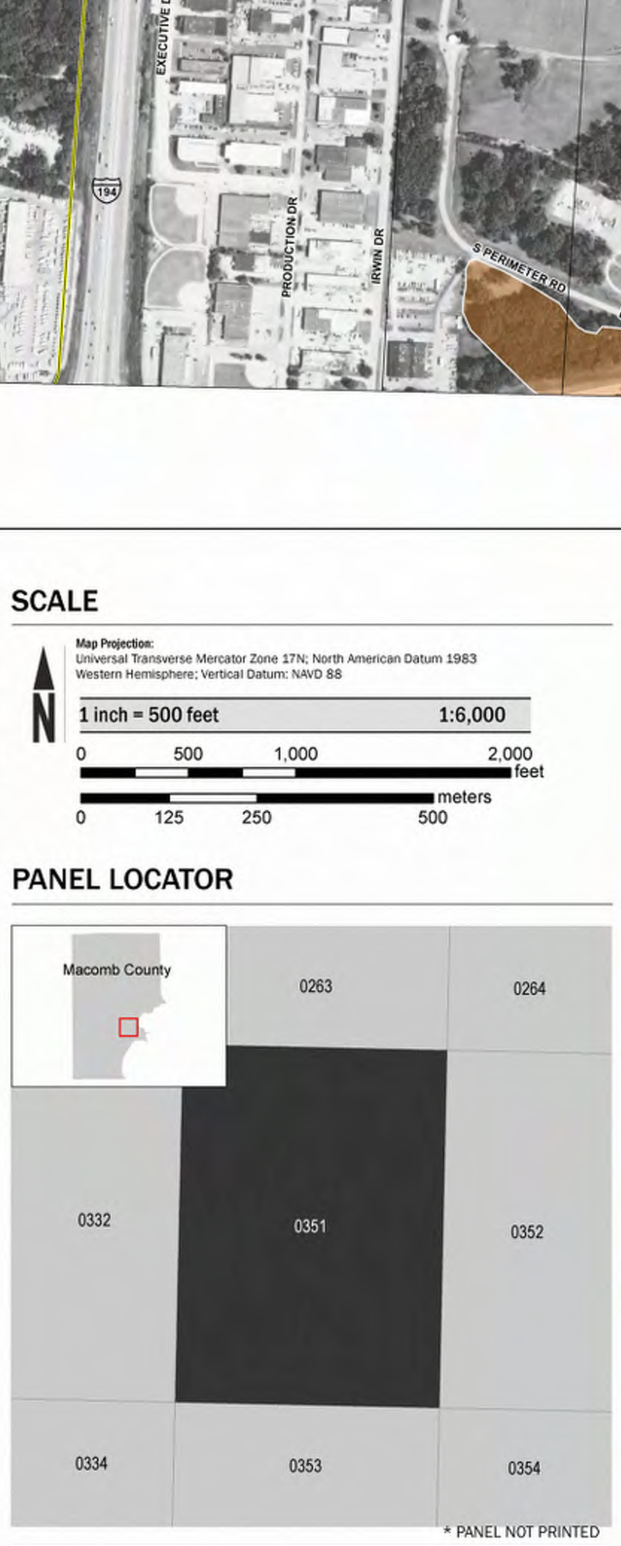
Map Projection:
Universal Transverse Mercator Zone 17N; North American Datum 1983
Western Hemisphere; Vertical Datum: NAVD 88

1 inch = 500 feet 1:6,000

0 500 1,000 2,000 feet

0 125 250 500 meters

PANEL LOCATOR



* PANEL NOT PRINTED

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

MACOMB COUNTY, MICHIGAN
(All Jurisdictions)

PANEL 351 OF 430

FEMA

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLINTON, CHARTER TOWNSHIP OF	260121	0351	J
HARRISON, TOWNSHIP OF	260123	0351	J
MOUNT CLEMENS, CITY OF	260124	0351	J

VERSION NUMBER
2.4.3.5

MAP NUMBER
26099C0351J

MAP REVISED
DECEMBER 30, 2020

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NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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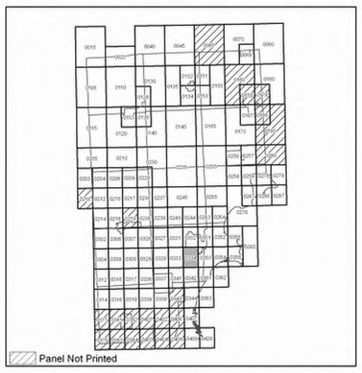
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which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

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

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

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

PANEL INDEX



LEGEND

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

The 1% annual chance flood (100 year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard may include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

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

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside of the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 10)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 — 23	Transect line
85° 03' 45.0", 41° 24' 22.5"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4587000 M	1000-meter Universal Transverse Mercator grid values, zone 17
2250000 FT	5000-foot grid ticks: Michigan State Plane South Coordinate System, 6401 zone (FIPSZONE 2113), Lambert Conformal Conic projection
KA0015	Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
SEPTEMBER 29, 2006

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0334G

FIRM
FLOOD INSURANCE RATE MAP
MACOMB COUNTY, MICHIGAN
(ALL JURISDICTIONS)

PANEL 334 OF 428
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

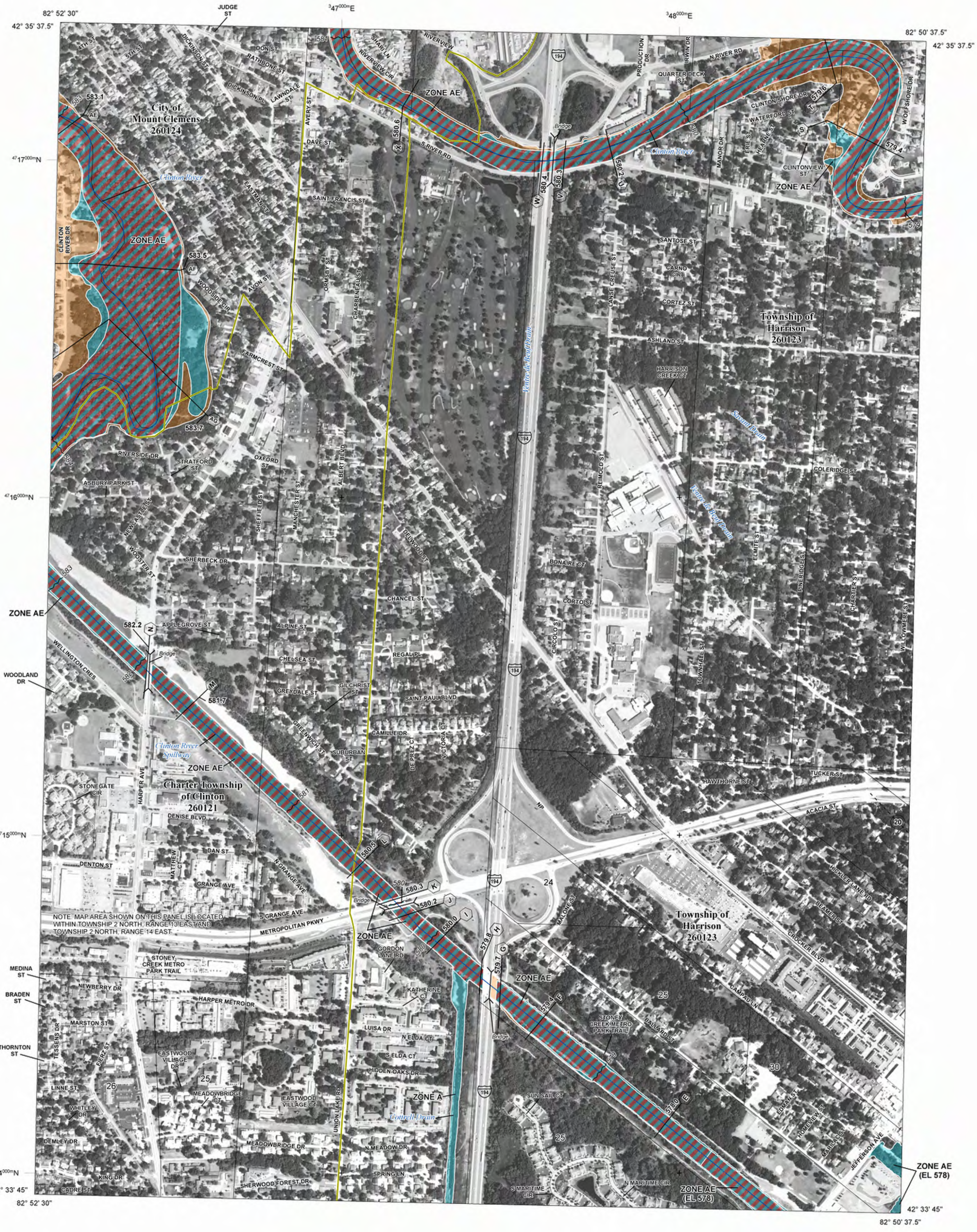
COMMUNITY	NUMBER	PANEL	SUFFIX
CLINTON, CHARTER TOWNSHIP OF	260121	0334	G
MOUNT CLEMENS, CITY OF	260124	0334	G

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

MAP NUMBER
26099C0334G

EFFECTIVE DATE
SEPTEMBER 29, 2006

Federal Emergency Management Agency



FLOOD HAZARD INFORMATION

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

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) *Zone A,V, A99*
	With BFE or Depth *Zone AE, AO, AH, VE, AR*
	Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
	Future Conditions 1% Annual Chance Flood Hazard *Zone X*
	Area with Reduced Flood Risk due to Levee See Notes. *Zone X*
	Area with Flood Risk due to Levee *Zone D*
OTHER AREAS	NO SCREEN Area of Minimal Flood Hazard *Zone X*
	Area of Undetermined Flood Hazard *Zone D*
GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall
OTHER FEATURES	18.2 / E / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
	8 Coastal Transect
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature
	513 Base Flood Elevation Line (BFE)
	Limit of Study
	Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

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

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

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was provided in digital format by the National Agriculture Imagery Program (NAIP). This information was derived from digital orthophotography at a 2-foot resolution from photography dated 2016.

SCALE

N

Map Projection:
Universal Transverse Mercator Zone 17N; North American Datum 1983
Western Hemisphere; Vertical Datum: NAVD 88

1 inch = 500 feet 1:6,000

0 500 1,000 2,000 feet

0 125 250 500 meters

PANEL LOCATOR

* PANEL NOT PRINTED

FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

MACOMB COUNTY, MICHIGAN
(All Jurisdictions)

PANEL 353 OF 430

FEMA

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLINTON, CHARTER TOWNSHIP OF	260121	0353	J
HARRISON, TOWNSHIP OF	260123	0353	J
MOUNT CLEMENS, CITY OF	260124	0353	J

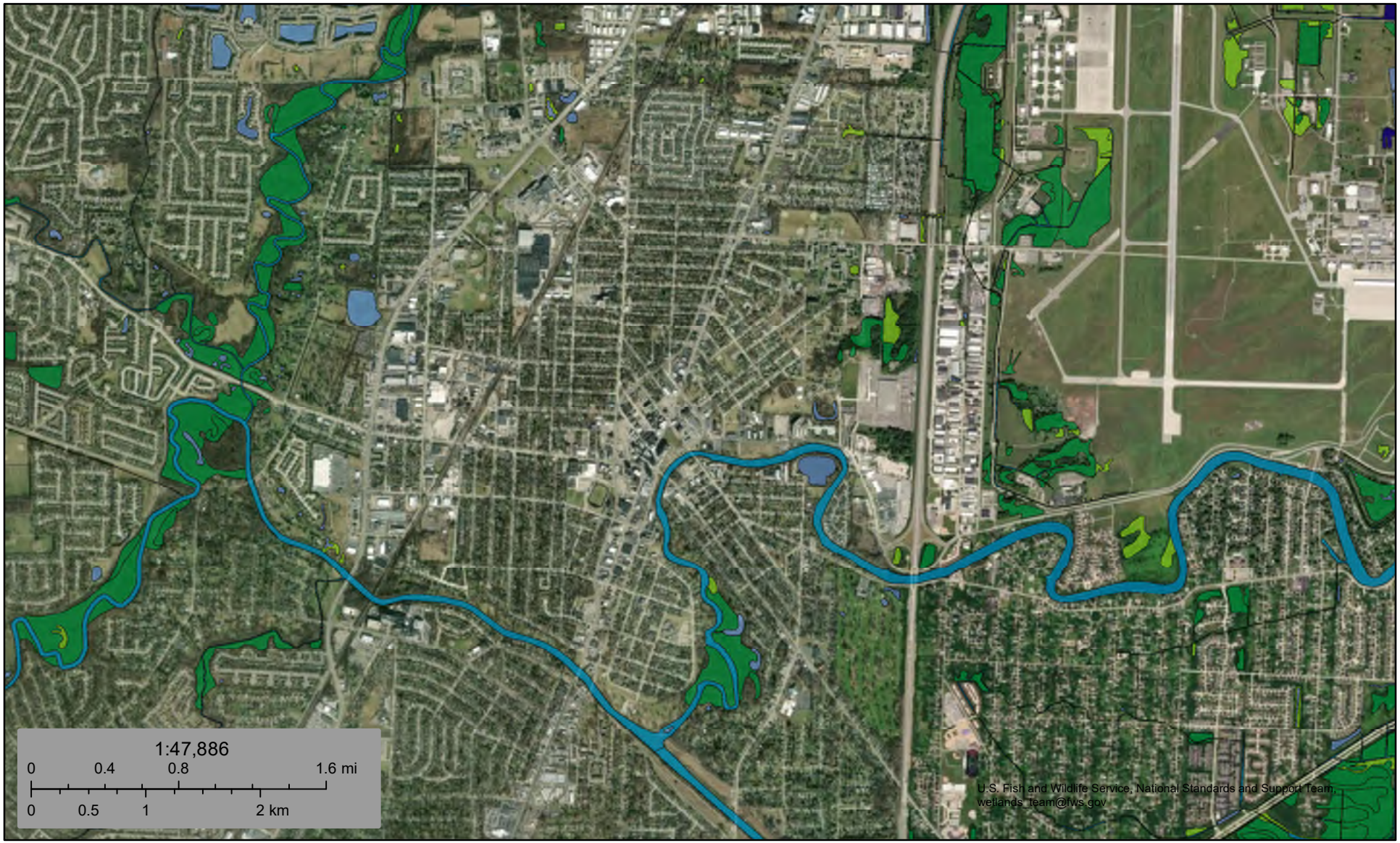
VERSION NUMBER
2.4.3.5

MAP NUMBER
26099C0353J

MAP REVISED
DECEMBER 30, 2020

U.S. Fish and Wildlife Service
National Wetlands Inventory

Wetlands



February 11, 2026

Wetlands

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

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

Appendix E

USGS Topographic Map

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

The National Map US Topo

MOUNT CLEMENS WEST QUADRANGLE
MICHIGAN - MACOMB COUNTY
7.5-MINUTE SERIES

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 17T

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, June 2020 - June 2020
Roads..... U.S. Census Bureau, 2016
Names.....GNIS, 1980 - 2023
Hydrography.....National Hydrography Dataset, 2006 - 2019
Contours.....National Elevation Dataset, 2019
Boundaries.....Multiple sources; see metadata file 2021 - 2022
Public Land Survey System.....BLM, 2018
Wetlands.....FWS National Wetlands Inventory Not Available

MN GN
7°39'
136 MILS
1°19'
23 MILS
UTM GRID AND 2023 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000 - m Square ID
LH
Grid Zone Designation
17T

SCALE 1:24 000
1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 5 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard.

MICHIGAN
QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

ADJOINING QUADRANGLES
1 Utica
2 Waldenburg
3 New Haven
4 Warren
5 Mount Clemens East
6 Highland Park
7 Grosse Pointe
8 Grosse Pointe OE E

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

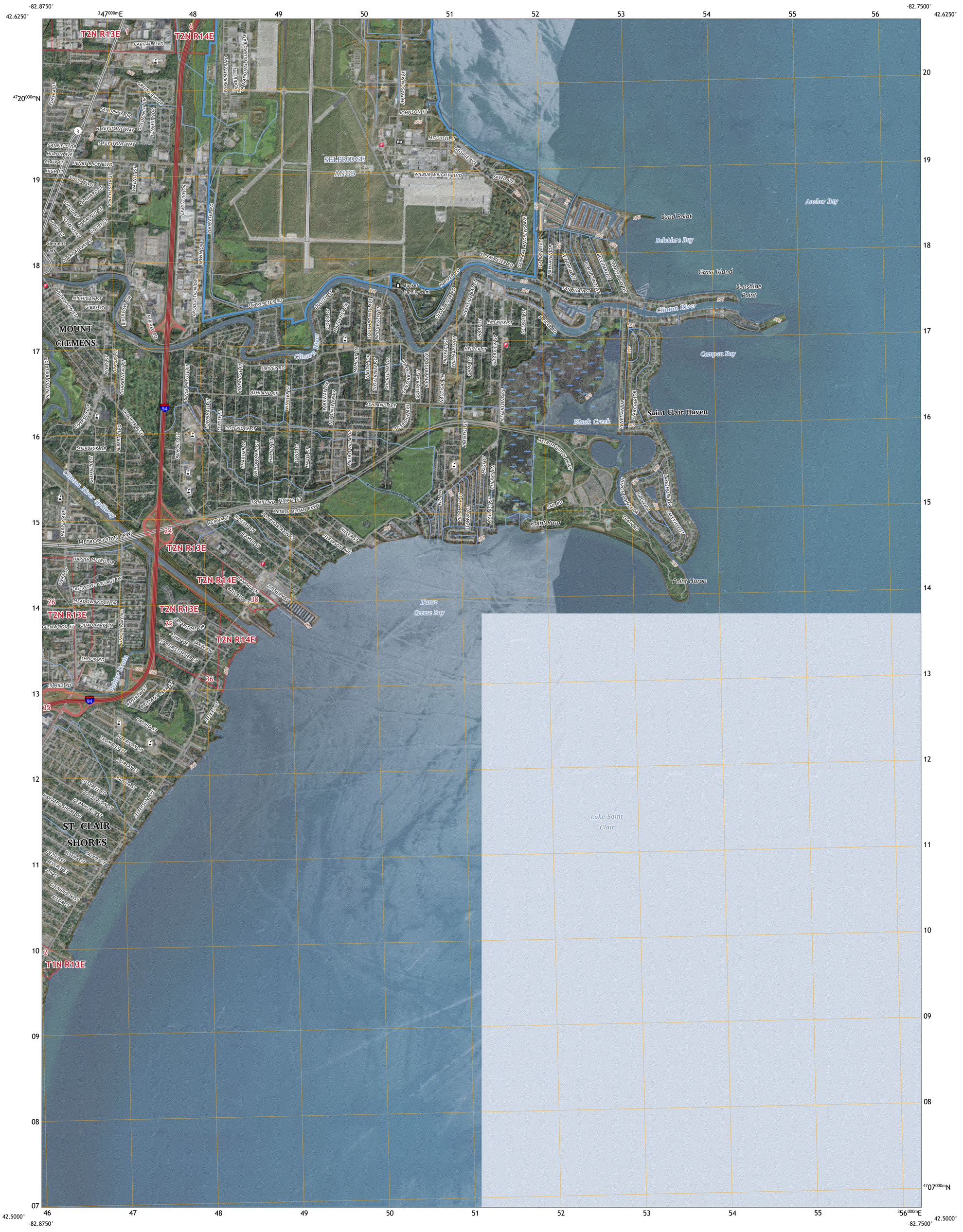
MOUNT CLEMENS WEST, MI
2023

NSN 7643016371403
NGA REF NO.USGSX24K30538

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

The National Map US Topo

MOUNT CLEMENS EAST QUADRANGLE
MICHIGAN - MACOMB COUNTY
7.5-MINUTE SERIES



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North American Datum of 1983 (NAD83)
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Hydrography.....National Hydrography Dataset, 2006 - 2019
Contours.....National Elevation Dataset, 2019
Boundaries.....Multiple sources; see metadata file 2020 - 2022
Public Land Survey System.....BLM, 2018
Wetlands.....FWS National Wetlands Inventory Not Available

MN
GN
7°45'
138 MILS
1°14'
22 MILS
UTM GRID AND 2023 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000 - m Square ID
LH
Grid Zone Designation
17T

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 5 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard.

QUADRANGLE LOCATION

1	2	3
4		5
6	7	

ADJOINING QUADRANGLES
1 Waldenburg
2 New Haven
3 New Baltimore
4 Mount Clemens West
5 Saint Clair Flats
6 Grosse Pointe
7 Grosse Pointe OE E

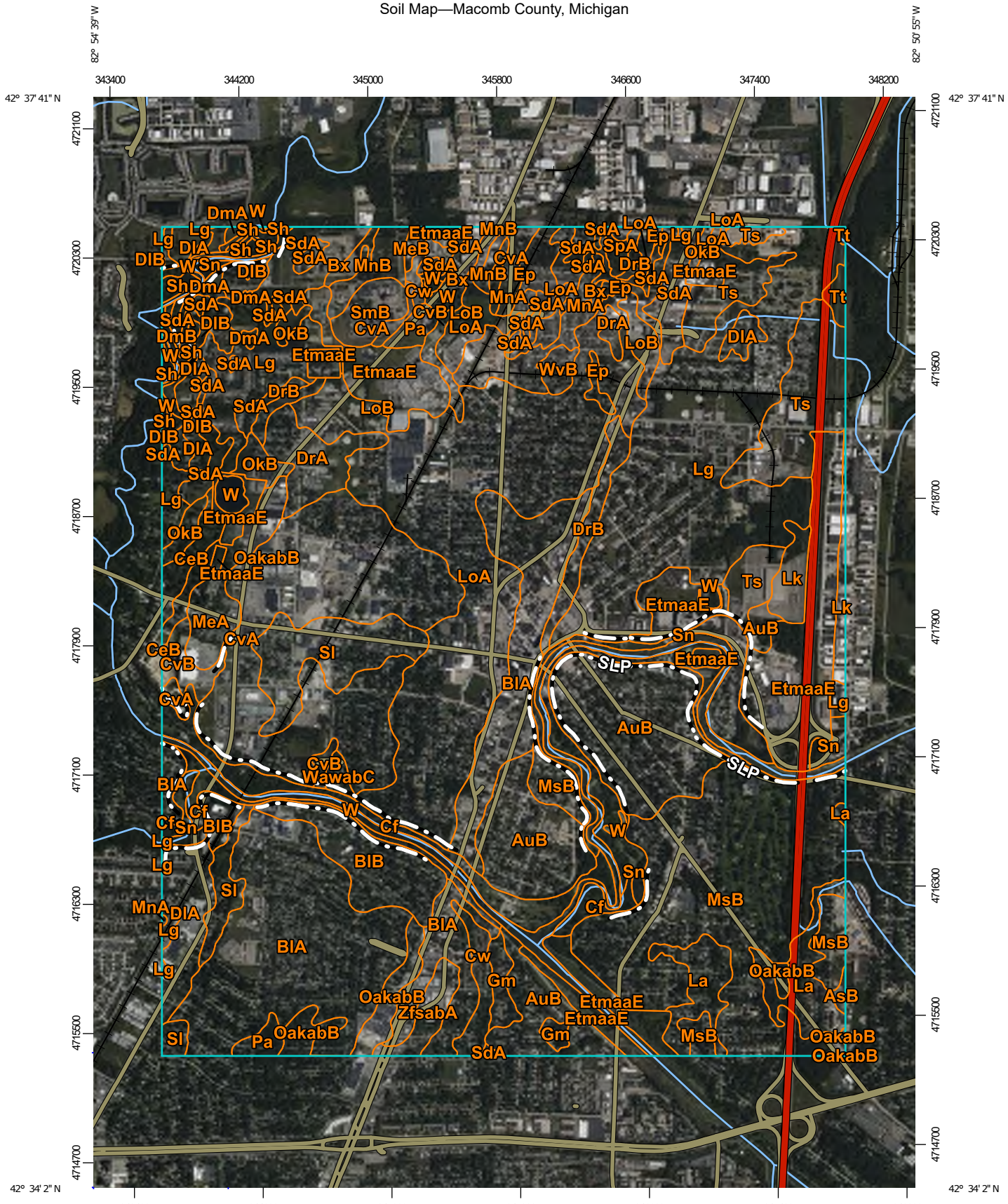
ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

MOUNT CLEMENS EAST, MI
2023

NSN. 7643016371402
NGA REF NO. USGSX24K30537

Appendix F

NRCS Soils Map



Map Scale: 1:32,900 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 450 900 1800 2700

Feet
0 1500 3000 6000 9000

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

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Macomb County, Michigan
Survey Area Data: Version 22, Sep 4, 2025

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

Date(s) aerial images were photographed: Jul 5, 2020—Sep 19, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AsB	Pipestone sand, Erie-Huron Lake Plain, 0 to 3 percent slopes	3.3	0.1%
AuB	Pipestone sand, loamy substratum, 0 to 6 percent slopes	359.0	6.6%
BlA	Blount loam, Erie-Huron Lake Plain, 0 to 2 percent slopes	556.0	10.3%
BlB	Blount loam, 2 to 6 percent slopes	100.5	1.9%
BsB	Boyer sandy loam, 2 to 6 percent slopes	1.2	0.0%
Bx	Brevort-Selfridge complex	36.9	0.7%
CeB	Celina loam, 2 to 6 percent slopes	23.1	0.4%
Cf	Ceresco fine sandy loam	117.7	2.2%
CvA	Conover loam, 0 to 2 percent slopes	413.7	7.7%
CvB	Conover loam, 2 to 6 percent slopes	46.1	0.9%
Cw	Corunna sandy loam	33.8	0.6%
DlA	Del Rey loam, 0 to 2 percent slopes	111.0	2.1%
DlB	Del Rey loam, 2 to 6 percent slopes	11.5	0.2%
DmA	Del Rey-Metamora sandy loams, 0 to 2 percent slopes	27.5	0.5%
DmB	Del Rey-Metamora sandy loams, 2 to 6 percent slopes	4.6	0.1%
DrA	Dryden sandy loam, 0 to 2 percent slopes	64.2	1.2%
DrB	Dryden sandy loam, 2 to 6 percent slopes	48.9	0.9%
Ep	Ensley-Parkhill complex	103.3	1.9%
EtmaaE	Udorthents and Udipsamments, nearly level to hilly	357.5	6.6%
Gm	Granby loamy fine sand	23.8	0.4%
La	Lamson fine sandy loam	95.6	1.8%
Lg	Lenawee silty clay loam, 0 to 1 percent slopes	624.5	11.6%
Lk	Lenawee-Selfridge complex, 0 to 3 percent slopes	42.0	0.8%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
LoA	Locke sandy loam, 0 to 2 percent slopes	629.2	11.6%
LoB	Locke sandy loam, 2 to 6 percent slopes	22.3	0.4%
MeA	Metamora fine sandy loam, 0 to 2 percent slopes	33.9	0.6%
MeB	Metamora fine sandy loam, 2 to 6 percent slopes	4.2	0.1%
MnA	Metea sand, 0 to 2 percent slopes	5.1	0.1%
MnB	Metea sand, 2 to 6 percent slopes	36.5	0.7%
MsB	Minoa fine sandy loam, 0 to 4 percent slopes	492.0	9.1%
OakabB	Oakville fine sand, Erie-Huron Lake Plain, 0 to 6 percent slopes	84.4	1.6%
OkB	Oakville fine sand, loamy substratum, 0 to 6 percent slopes	35.5	0.7%
Pa	Parkhill loam, 0 to 1 percent slopes	24.7	0.5%
SdA	Selfridge loamy sand, 0 to 3 percent slopes	111.4	2.1%
Sh	Shoals loam	30.1	0.6%
Sl	Sims clay loam	130.4	2.4%
SmB	Sisson fine sandy loam, 2 to 6 percent slopes	32.0	0.6%
Sn	Sloan loam	143.3	2.7%
SpA	Spinks loamy sand, 0 to 2 percent slopes	2.3	0.0%
SpB	Spinks loamy sand, 2 to 6 percent slopes	7.4	0.1%
Ts	Toledo silty clay loam	189.9	3.5%
Tt	Toledo clay	9.5	0.2%
W	Water	126.6	2.3%
WawabC	Wawasee loam, 6 to 12 percent slopes	7.7	0.1%
WvB	Wasepi-Pipestone complex, 0 to 4 percent slopes	12.7	0.2%
ZfsabA	Ziegenfuss clay, 0 to 1 percent slopes	27.1	0.5%
Totals for Area of Interest		**5,403.8**	**100.0%**

Appendix G

WWTP NPDES Permit

PERMIT NO. MI0023647

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the federal Clean Water Act (federal Water Pollution Control Act, 33 U.S.C., Section 1251 *et seq.*, as amended); Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); Part 41, Sewerage Systems, of the NREPA; and Michigan Executive Order 2019-06,

City of Mount Clemens
One Crocker Boulevard
Mount Clemens, MI 48043

is authorized to discharge from the **Mount Clemens Wastewater Treatment Plant** located at

1750 Clara Street
Mount Clemens, MI 48043

designated as **Mt Clemens WWTP**

to the receiving water named the Clinton River in accordance with effluent limitations, monitoring requirements, and other conditions set forth in this permit.

This permit is based on a complete application submitted on April 7, 2020.

This permit takes effect on August 1, 2021. The provisions of this permit are severable. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term in accordance with applicable laws and rules. On its effective date, this permit shall supersede National Pollutant Discharge Elimination System (NPDES) Permit No. MI0023647 (expiring October 1, 2020).

This permit and the authorization to discharge shall expire at midnight on **October 1, 2025**. In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit an application that contains such information, forms, and fees as are required by the Michigan Department of Environment, Great Lakes, and Energy (Department) by **April 4, 2025**.

Issued: June 25, 2021.

Original signed by Christine Alexander
Christine Alexander, Manager
Permits Section
Water Resources Division

PERMIT FEE REQUIREMENTS

In accordance with Section 324.3120 of the NREPA, the permittee shall make payment of an annual permit fee to the Department for each October 1 the permit is in effect regardless of occurrence of discharge. The permittee shall submit the fee in response to the Department's annual notice. Payment may be made electronically via the Department's MiWaters system. The MiWaters website is located at https://miwaters.deq.state.mi.us. Payment shall be submitted or postmarked by January 15 for notices mailed by December 1. Payment shall be submitted or postmarked no later than 45 days after receiving the notice for notices mailed after December 1.

Annual Permit Fee Classification: Municipal Major, 10 MGD to less than 50 MGD (Individual Permit)

In accordance with Section 324.3132 of the NREPA, the permittee shall make payment of an annual biosolids land application fee to the Department if the permittee land applies biosolids. The permittee shall submit the fee in response to the Department's annual notice. Payment may be made electronically via the Department's MiWaters system. The MiWaters website is located at https://miwaters.deq.state.mi.us. Payment shall be submitted or postmarked no later than January 31 of each year for notices mailed by December 15. Payment shall be submitted or postmarked no later than 45 days after receiving the notice for notices mailed after December 15.

CONTACT INFORMATION

Unless specified otherwise, all contact with the Department required by this permit shall be made to the Warren District Office of the Water Resources Division. The Warren District Office is located at 27700 Donald Court, Warren, MI 48092-2793, Telephone: 586-753-3700, Fax: 586-751-4690.

CONTESTED CASE INFORMATION

Any person who is aggrieved by this permit may file a sworn petition with the Michigan Administrative Hearing System within the Michigan Department of Licensing and Regulatory Affairs, c/o the Michigan Department of Environment, Great Lakes, and Energy, setting forth the conditions of the permit which are being challenged and specifying the grounds for the challenge. The Department of Licensing and Regulatory Affairs may reject any petition filed more than 60 days after issuance as being untimely.

PART I

Section A. Limitations and Monitoring Requirements

1. Final Effluent Limitations, Monitoring Point 001A

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge treated municipal wastewater from Monitoring Point 001A through Outfall 001. Outfall 001 discharges to the Clinton River at Latitude 42.59828, Longitude -82.86533. Such discharge shall be limited and monitored by the permittee as specified below.

Parameter	Maximum Limits for Quantity or Loading				Maximum Limits for Quality or Concentration				Monitoring Frequency	Sample Type
	Monthly	7-Day	Daily	Units	Monthly	7-Day	Daily	Units		
Flow	(report)	---	(report)	MGD	---	---	---	---	Daily	Report Total Daily Flow
Carbonaceous Biochemical Oxygen Demand (CBOD5)										
May – September	200	500	(report)	lbs/day	4	---	10	mg/l	Daily	24-Hr Composite
October – November	700	1000	(report)	lbs/day	14	---	21	mg/l	Daily	
December – March	1200	2000	(report)	lbs/day	25	40	(report)	mg/l	Daily	
April	1000	1600	(report)	lbs/day	21	---	32	mg/l	Daily	
Total Suspended Solids (TSS)										
May – September	1000	1500	(report)	lbs/day	20	30	(report)	mg/l	Daily	24-Hr Composite
October – April	1500	2200	(report)	lbs/day	30	45	(report)	mg/l	Daily	
Ammonia Nitrogen (as N)										
May – September	25	100	(report)	lbs/day	0.5	---	2.0	mg/l	Daily	24-Hr Composite
October – November	---	400	(report)	lbs/day	---	---	8.0	mg/l	Daily	
December – March	(report)	---	(report)	lbs/day	(report)	---	(report)	mg/l	Daily	
April	---	600	(report)	lbs/day	---	---	12	mg/l	Daily	
Total Phosphorus (as P)	50	---	(report)	lbs/day	1.0	---	(report)	mg/l	Daily	24-Hr Composite
Available Cyanide	1.0	---	(report)	lbs/day	13	---	(report)	ug/l	Monthly	Grab
Total Selenium	1.0	---	(report)	lbs/day	13	---	(report)	ug/l	Monthly	Grab
Fecal Coliform Bacteria	---	---	---	---	200	400	(report)	cts/ 100 ml	Daily	Grab
Total Mercury										
Corrected	0.00007	---	(report)	lbs/day	1.3	---	(report)	ng/l	Quarterly	Calculation
Uncorrected	---	---	---	---	---	---	(report)	ng/l	Quarterly	Grab
Field Duplicate	---	---	---	---	---	---	(report)	ng/l	Quarterly	Grab
Field Blank	---	---	---	---	---	---	(report)	ng/l	Quarterly	Preparation
Laboratory Method Blank	---	---	---	---	---	---	(report)	ng/l	Quarterly	Preparation

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Section A. Limitations and Monitoring Requirements

Parameter					Minimum % Monthly		Minimum % Daily	Units	Monitoring Frequency	Sample Type
CBOD5 Minimum % Removal										
December – March	---	---	---	---	85	---	(report)	%	Monthly	Calculation
TSS Minimum % Removal										
October – April	---	---	---	---	85	---	(report)	%	Monthly	Calculation
					Minimum Daily		Maximum Daily			
pH	---	---	---	---	6.5	---	9.0	S.U.	Daily	Grab
Dissolved Oxygen										
May – November	---	---	---	---	6.0	---	---	mg/l	Daily	Grab
December – April	---	---	---	---	3.0	---	---	mg/l	Daily	

The following design flow was used in determining the above limitations, but is not to be considered a limitation or actual capacity: 6.0 MGD.

a. Narrative Standard
The receiving water shall contain no turbidity, color, oil films, floating solids, foams, settleable solids, or deposits as a result of this discharge in unnatural quantities which are or may become injurious to any designated use.

b. Sampling Locations
Samples for CBOD5, TSS, Ammonia Nitrogen, Total Phosphorus, and Total Mercury shall be taken prior to disinfection. Samples for Available Cyanide, Total Selenium, Fecal Coliform Bacteria, pH, and Dissolved Oxygen shall be taken after disinfection. The Department may approve alternate sampling locations that are demonstrated by the permittee to be representative of the effluent.

c. Ultraviolet Disinfection
It is understood that ultraviolet light will be used to achieve compliance with the fecal coliform limitations. If disinfection other than ultraviolet light will be used, the permittee shall notify the Department in accordance with Part II.C.12. of this permit.

d. Percent Removal Requirements
Monthly percent removal shall be calculated based on the monthly average effluent CBOD5 and TSS concentrations and the monthly average influent concentrations for approximately the same period. Daily percent removal shall be calculated based on the daily effluent CBOD5 and TSS concentrations and the daily influent concentrations for the same day. Reporting of Daily percent removal is only required on days on which an influent sample is obtained.

e. Monitoring Frequency Reduction for Available Cyanide and Total Selenium
After the submittal of 12 months of data, the permittee may request, in writing, Department approval for a reduction in monitoring frequency for Available Cyanide and/or Total Selenium. This request shall contain an explanation as to why the reduced monitoring is appropriate. Upon receipt of written approval and consistent with such approval, the permittee may reduce the monitoring frequency indicated in Part I.A.1. of this permit. The monitoring frequency for Available Cyanide and Total Selenium shall not be reduced to less than annually. The Department may revoke the approval for reduced monitoring at any time upon notification to the permittee.

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Section A. Limitations and Monitoring Requirements

f. Total Mercury Testing and Additional Reporting Requirements

The analytical protocol for total mercury shall be in accordance with EPA Method 1631, Revision E, "Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry," EPA-821-R-02-019, August 2002. The quantification level for total mercury shall be 0.5 ng/l, unless a higher level is appropriate because of sample matrix interference. Justification for higher quantification levels shall be submitted to the Department within 30 days of such determination.

The use of clean technique sampling procedures is required unless the permittee can demonstrate to the Department that an alternate sampling procedure is representative of the discharge. Guidance for clean technique sampling is contained in EPA Method 1669, "Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels (Sampling Guidance)," EPA-821-R96-001, July 1996. Information and data documenting the permittee's sampling and analytical protocols and data acceptability shall be submitted to the Department upon request.

In order to demonstrate compliance with EPA Method 1631E and EPA Method 1669, the permittee shall report, on the daily sheet, the analytical results of all field blanks and field duplicates collected in conjunction with each sampling event, as well as laboratory method blanks when used for blank correction. The permittee shall collect at least one (1) field blank and at least one (1) field duplicate per sampling event. If more than ten (10) samples are collected during a sampling event, the permittee shall collect at least one (1) additional field blank AND field duplicate for every ten (10) samples collected. Only field blanks or laboratory method blanks may be used to calculate a concentration lower than the actual sample analytical results (i.e., a blank correction). Only one (1) blank (field OR laboratory method) may be used for blank correction of a given sample result, and only if the blank meets the quality control acceptance criteria. If blank correction is not performed on a given sample analytical result, the permittee shall report under "Total Mercury – Corrected" the same value reported under "Total Mercury – Uncorrected." The field duplicate is for quality control purposes only; its analytical result shall not be averaged with the sample result.

g. Quarterly Monitoring

Quarterly samples shall be taken during the months of January, April, July, and October. If the facility does not discharge during these months, the permittee shall sample the next discharge occurring during the period in question. If the facility does not discharge during the period in question, a sample is not required for that period. For any month in which a sample is not taken, the permittee shall enter "*G" on the Discharge Monitoring Report (DMR). (For purposes of reporting on the Daily tab of the DMR, the permittee shall enter "*G" on the first day of the month only).

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Section A. Limitations and Monitoring Requirements

2. Retention Treatment Basin (RTB) Discharge Authorization, Monitoring Point 003A

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge treated combined sewage from the RTB from Monitoring Point 003A through Outfall 003 when the basin is full and flows exceed the maximum wastewater treatment plant capacity of 10 MGD. Outfall 003 discharges to the Clinton River at Latitude 42.59762, Longitude -82.86595. Such discharge shall be limited and monitored by the permittee as specified below.

Parameter	Maximum Limits for Quantity or Loading				Maximum Limits for Quality or Concentration				Monitoring Frequency	Sample Type
	Monthly	7-Day	Daily	Units	Monthly	7-Day	Event	Units		
Influent Characteristics										
Flow	(report)	---	(report)	MGD	---	---	---	---	Daily	Report Total Daily Flow
Effluent Characteristics										
Flow	(report)	---	(report)	MGD	---	---	---	---	Daily	Report Total Daily Flow
Biochemical Oxygen Demand (BOD5)	---	---	---	---	---	---	(report)	mg/l	Event	See a. below
Total Suspended Solids (TSS)	---	---	---	---	---	---	(report)	mg/l	Event	See a. below
Ammonia Nitrogen (as N)	---	---	---	---	---	---	(report)	mg/l	Event	See a. below
Total Phosphorus (as P)	---	---	---	---	---	---	(report)	mg/l	Event	See a. below
Fecal Coliform Bacteria										
May – October November – April	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	400 1000	cts/ 100 ml	See a. below	Grab
					Event Average					
Total Residual Chlorine (TRC)	---	---	---	---	(report)	---	(report)	ug/l	See a. below	Grab
					Event Minimum					
pH	---	---	---	---	(report)	---	(report)	S.U.	Daily	Grab
Dissolved Oxygen	---	---	---	---	(report)	---	---	mg/l	Daily	Grab

PART I

Section A. Limitations and Monitoring Requirements

a. RTB Monitoring and Reporting

The permittee shall conduct RTB monitoring and reporting consistent with the requirements of Part II.C.2. of this permit. The permittee shall supply the results of each sample taken during each discharge period.

An **Event** is defined as commencing when combined sewage is discharged into the facility and ending when effluent flow (if any) ceases and does not resume within 24 hours.

Influent flow shall be reported for all wet-weather events where combined sewage is discharged to the facility. Influent flow reporting shall also indicate the component of the total influent flow that is dewatered to the interceptor from the facility during an event and shall be reported in the comment section on the Summary tab of the Discharge Monitoring Reports (DMR). Alternate procedures may be approved by the Department.

Effluent flow shall be reported for all events that cause discharge from the facility to the receiving waters.

Effluent sampling for BOD5, TSS, ammonia nitrogen (as N), and total phosphorus (as P) shall be by flow-proportioned composite sampling over the entire event. Alternate procedures for determining an event composite may be approved by the Department if existing equipment cannot reliably obtain a flow-proportioned composite sample. For purposes of reporting for a discharge event that occurs on multiple calendar days, the composite sample concentrations for the event shall be reported on the day the discharge event ended. The analytical results of each event composite sample obtained during a reporting month shall be reported on the Daily tab of the DMRs. The highest event composite sample concentrations observed during a reporting period shall be reported on the Summary tab of the DMRs.

For **effluent pH**, report the maximum value of any individual sample taken during the month in the "Maximum" column under "Quality or Concentration" on the Summary tab of the DMRs and the minimum value of any individual sample taken during the month in the "Minimum" column under "Quality or Concentration" on the Summary tab of the DMRs. The individual values taken during the month shall be reported on the Daily tab of the DMRs.

For **effluent dissolved oxygen**, report the minimum concentration of any individual sample taken during the month in the "Minimum" column under the "Quality or Concentration" on the Summary tab of the DMRs. The individual values taken during the month shall be reported on the Daily tab of the DMRs.

For **effluent fecal coliform bacteria and TRC,** grab samples shall be collected every two (2) hours for the first six (6) hours of the discharge and every four (4) hours thereafter for the duration of the discharge. The first sample shall be collected as soon as practical after the discharge begins. The goal of the effluent sampling program is to collect at least three (3) samples during each discharge event, and samples shall be collected at shorter intervals at the onset of the event if the permittee estimates that the event duration may be less than six (6) hours. For purposes of reporting for a discharge event that occurs on multiple calendar days, the pollutant concentrations for the event shall be reported on the day the discharge event ended.

For **fecal coliform bacteria**, the geometric mean of all samples taken during an event shall be reported as the "Event Maximum" on the Daily tab of the DMRs, provided that three (3) or more samples were collected. The highest event geometric mean reported during the month shall be reported in the "Maximum" column under "Quality or Concentration" on the Summary tab of the DMRs.

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For TRC, the highest value of all samples taken during an event shall be reported as the "Event Maximum" on the Daily tab of the DMRs. The average of all samples in an event shall be reported as the "Event Average" on the Daily tab of the DMRs. The highest Event Maximum reported during the month shall be reported in the "Maximum" column under "Quality or Concentration" on the Summary tab of the DMRs. The highest Event Average reported during the month shall be reported in the "Average" column under "Quality or Concentration" on the Summary tab of the DMRs.

b. RTB Dewatering
The RTB shall be promptly dewatered as soon as possible following the need to divert flow to the basin and shall be maintained in readiness for use. The discharge of sludge or residual accumulations from the basin to the surface waters of the state is prohibited. These sludges shall be promptly removed and disposed of in accordance with procedures approved by the Department.

c. Narrative Standard
The receiving water shall contain no turbidity, color, oil films, floating solids, foams, settleable solids, or deposits as a result of this discharge in unnatural quantities which are or may become injurious to any designated use.

d. Operation and Maintenance Plan
The permittee shall ensure that discharges only occur in response to rainfall or snowmelt events and cease soon thereafter. Any rehabilitation and maintenance needs shall be addressed to ensure adequate sewer capacity and functionality. This may be accomplished through continued implementation of the approved Operation and Maintenance Plan.

e. Disconnection of Eaves Troughs and Roof Downspouts
Direct connections of eaves troughs and roof downspouts to the sewer system throughout the service area tributary to the combined sewer overflow outfalls are prohibited. This requirement does not apply if the permittee has demonstrated that the disconnection of eaves troughs and roof downspouts is not a cost-effective means of reducing the frequency or duration of overflows or of maintaining compliance with this permit. Such a demonstration and supporting documentation shall be submitted to the Department for approval.

f. New Wastewater Flows
Increased levels of discharge of sanitary sewage from the RTB are prohibited unless:

1) The increased discharge is the result of new sanitary wastewater flows that, on the basis of sound professional judgment, are determined to be within design peak dry weather transportation capacity; or

2) The permittee has officially adopted and is timely implementing a program, satisfactory to the Department, leading to the construction and operation of necessary collection, transportation, or treatment devices.

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Section A. Limitations and Monitoring Requirements

3. Total Residual Chlorine Minimization Program

This condition establishes the requirements necessary for the permittee to develop and implement a Total Residual Chlorine (TRC) Minimization Program (Program) necessary to operate the facility in a manner providing consistent, effective disinfection while minimizing the discharge of TRC. The permittee shall maintain compliance with the fecal coliform bacteria effluent limits set forth in Part I.A.2. of this permit during development and implementation of the Program.

The water quality-based effluent limitation for TRC necessary to protect the receiving water against acute toxicity is 0.038 mg/l (38 ug/l). Upon completion of the Program, the permittee shall operate the facility in compliance with the following TRC operational goals: 1.5 mg/l as an event average and 2.0 mg/l (November – April) / 3.0 mg/l (May – October) as an event instantaneous maximum. If upon completion of the Program the permittee determines the facility can achieve lower TRC concentrations than these operational goals, the permittee shall operate the facility to achieve the lower TRC concentrations. If any TRC concentration is exceeded for a CSO discharge event, the permittee shall submit a written report to the Department within seven (7) days, explaining the cause of the exceedance and describing the corrective measures that will be undertaken to prevent a future recurrence.

The permittee shall develop and implement the Program in accordance with the following schedule:

Upon notification by the department, the permittee shall submit to the Department an approvable Program. The Program shall describe the means by which the permittee will evaluate various operational practices under a variety of wet weather events to identify measures that can be taken to reduce TRC discharge concentrations. The Program shall be implemented upon receipt of written approval from the Department.

On or before 18 months from receipt of written approval from the Department, the permittee shall complete the approved Program. In the event that a sufficient number of CSO discharge events have not occurred during this 18-month period to allow for adequate implementation of the Program, the permittee may submit for Department approval a written request for an extension.

On or before 60 days following completion of the approved Program, the permittee shall submit to the Department a written report summarizing the results of the Program and specifying TRC minimization procedures to be implemented at the facility. At a minimum, the report shall specify the following:

a. the expected achievable TRC discharge concentrations,

b. the protocols to be used to manage sodium hypochlorite (NaOCl) dosage rates under various conditions to achieve the operational goals set forth herein,

c. facility modifications needed to enhance the facility's ability to control TRC levels while maintaining compliance with the fecal coliform bacteria limits set forth in Part I.A.1. of this permit, and

d. the procedures developed to adjust NaOCl feed rates to minimize the discharge of TRC.

Upon completion of the Program, the Department may re-evaluate the need for TRC effluent limitations. This permit may be modified in accordance with applicable laws and rules to incorporate such revisions as may be necessary to comply with water quality standards at the time of discharge.

TRC minimization procedures shall be implemented upon receipt of written approval from the Department and consistent with such approval. These TRC minimization procedures shall also be submitted as part of the Facilities and Sewerage System Operational Plan required under Part I.A.6. of this permit.

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Section A. Limitations and Monitoring Requirements

4. Mixing Zone Demonstration for Total Residual Chlorine

The permittee shall conduct a Total Residual Chlorine (TRC) Mixing Zone Demonstration (Demonstration) that satisfies the requirements set forth in R 323.1082(7) in accordance with the following schedule. The purpose of the Demonstration shall be to demonstrate to the Department that an acute mixing zone for TRC, along with alternative TRC limits, are warranted:

Upon notification by the department, the permittee shall submit to the Department an approvable Work Plan for implementing the Demonstration. The Work Plan shall address all elements set forth in R 323.1082(7) including an In-Stream TRC Effluent Plume Evaluation (Evaluation) satisfying the requirements set forth in R 323.1082(7)(a)(i) and (iv) to evaluate the TRC effluent plume(s) attributable to the facility's discharge. The Evaluation shall identify the location and size of the TRC effluent plume during and after CSO discharge events and identify the maximum TRC concentrations in-stream at various downstream locations. The Work Plan may be designed to demonstrate to the Department that the results of an Evaluation conducted for the facility, or a predictive model with verification sampling, can be adequately used to determine water quality impacts on the receiving water from TRC effluent plume(s) attributable to the facility in lieu of results from an Evaluation.

Upon receipt of written approval from the Department, the permittee shall implement the Demonstration in accordance with the approved Work Plan.

Upon notification by the department, the permittee shall submit to the Department an approvable Demonstration. If the Demonstration cannot be completed by this date due to circumstances beyond the control of the permittee, such as an insufficient number of overflow events occurring during the Demonstration period, the permittee may submit for Department approval a written request for an extension.

Upon completion of the Demonstration, the Department may re-evaluate the need for TRC effluent limitations. This permit may be modified in accordance with applicable laws and rules to incorporate such revisions as may be necessary to comply with water quality standards at the time of discharge.

5. Facilities and Sewerage System Operational Plan

The purpose of the Facilities and Sewerage System Operational Plan is to ensure that the facility is operated to maximize treatment, convey all dry weather flows and the greatest quantity of wet weather flows to the treatment facilities for treatment, and to minimize untreated wastewater discharges.

a. The permittee shall continue to implement the Facilities and Sewerage System Operational Plan (Plan) approved by the Department on October 17, 2018, with modifications thereto. Any changes to the Plan which affect the rate, volume, or system storage and transportation for conveyance of wet weather flows shall be submitted to the Department for approval prior to implementation. The Plan includes the following:

1) the procedures utilized at the facility to adjust NaOCl disinfectant feed rates to minimize the discharge of total residual chlorine (TRC) and meet the TRC requirements specified in Part I.A.1. of this permit;

2) the procedures and schedule for sampling/monitoring the stored NaOCl disinfectant at the facility to determine the concentration of available chlorine and ensure that the stored NaOCl is of sufficient strength to provide effective disinfection;

3) the procedures for ensuring that the vendor's certified values for the available chlorine concentration of each load of NaOCl delivered to the facility are available for Department inspection/review;

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4) the procedures to ensure that the collection and treatment systems are operated to maximize treatment;

5) the procedures to ensure that all dry weather flows are conveyed to the treatment facilities for treatment without bypass;

6) the hydraulic profile and hydraulic operational elevations for system pump stations, regulators, diversion devices, gates, level sensors, interceptors, etc. to ensure the conveyance of all dry weather flows to the treatment facilities for treatment without bypass;

7) the procedures to ensure that the sewerage system hydraulic and storage capacity is identified and fully utilized during wet weather events with eventual transport and treatment of stored flows;

8) the hydraulic profile and hydraulic operational elevations for system pump stations, regulators, diversion devices, gates, level sensors, interceptors, etc. to ensure that the greatest quantity of wet weather flow is conveyed to the treatment facilities for treatment to minimize combined sewage discharges;

9) the procedures to ensure that the greatest quantity of wet weather flow is conveyed to the treatment facilities for treatment to minimize untreated wastewater discharges within the region tributary to the facility;

10) the procedures to ensure the sewerage system is maintained at its optimum operational capability, including procedures for dewatering the CSO retention basin as soon as possible after use;

11) the procedures for ongoing inspection of the sewer system within the permittee's jurisdiction for excessive inflow and infiltration and, where necessary, reduction of the excessive infiltration and inflow sources and the elimination of unauthorized sewer system connections; and

12) the location of all rain gauges.

b. On or before January 1 of each year, the permittee shall submit to the Department a Plan update which incorporates all changes made to the Plan during the previous 12-month period. Each Plan update shall also include the following operational data for the facility from the previous 12-month period:

1) the recorded values of the stored sodium hypochlorite (NaOCl) disinfectant strength (see 2) below),

2) the recorded values of the strength of the chemical loads of NaOCl delivered to the facility,

3) the operational modes for the facility (i.e., first-flush cell operation, parallel cell mode of operation, etc.) utilized during the previous 12 months, and

4) (if applicable) a summary of any TRC exceedances reported during the previous calendar year, the cause of the exceedances, and the corrective measures that will be undertaken to prevent a future reoccurrence.

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6. Quantification Levels and Analytical Methods for Selected Parameters

Maximum acceptable quantification levels (QLs) are specified for selected parameters in the table below. These QLs shall be considered the maximum acceptable unless a higher QL is appropriate because of sample matrix interference. Justification for higher QLs shall be submitted to the Department within 30 days of such determination. Where necessary to help ensure that the QLs specified can be achieved, analytical methods may also be specified in the table below. The sampling procedures, preservation and handling, and analytical protocol for all monitoring conducted in compliance with this permit, including monitoring conducted to meet the requirements of the application for permit reissuance, shall be in accordance with the methods specified in the table below, or in accordance with Part II.B.2. of this permit if no method is specified in the table below, unless an alternate method is approved by the Department. **Not all QLs are expressed in the same units in the table below.** The table is continued on the following page:

Parameter	QL	Units	Analytical Method
1,2-Diphenylhydrazine (as Azobenzene)	3.0	ug/l	
2,4,6-Trichlorophenol	5.0	ug/l	
2,4-Dinitrophenol	19	ug/l	
3,3'-Dichlorobenzidine	1.5	ug/l	
4-Chloro-3-Methylphenol	7.0	ug/l	
4,4'-DDD	0.01	ug/l	
4,4'-DDE	0.01	ug/l	
4,4'-DDT	0.01	ug/l	
Acrylonitrile	1.0	ug/l	
Aldrin	0.01	ug/l	
Alpha-Endosulfan	0.01	ug/l	
Alpha-Hexachlorocyclohexane	0.01	ug/l	
Antimony, Total	1	ug/l	
Arsenic, Total	1	ug/l	
Barium, Total	5	ug/l	
Benzidine	0.1	ug/l	
Beryllium, Total	1	ug/l	
Beta-Endosulfan	0.01	ug/l	
Beta-Hexachlorocyclohexane	0.01	ug/l	
Bis (2-Chloroethyl) Ether	1.0	ug/l	
Bis (2-Ethylhexyl) Phthalate	5.0	ug/l	
Boron, Total	20	ug/l	
Cadmium, Total	0.2	ug/l	
Chlordane	0.01	ug/l	
Chloride	1.0	mg/l	
Chromium, Hexavalent	5	ug/l	
Chromium, Total	10	ug/l	
Copper, Total	1	ug/l	
Cyanide, Available	2	ug/l	EPA Method OIA 1677
Cyanide, Total	5	ug/l	
Delta-Hexachlorocyclohexane	0.01	ug/l	
Dieldrin	0.01	ug/l	

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Parameter	QL	Units	Analytical Method
Di-N-Butyl Phthalate	9.0	ug/l	
Endosulfan Sulfate	0.01	ug/l	
Endrin	0.01	ug/l	
Endrin Aldehyde	0.01	ug/l	
Fluoranthene	1.0	ug/l	
Heptachlor	0.01	ug/l	
Heptachlor Epoxide	0.01	ug/l	
Hexachlorobenzene	0.01	ug/l	
Hexachlorobutadiene	0.01	ug/l	
Hexachlorocyclopentadiene	0.01	ug/l	
Hexachloroethane	5.0	ug/l	
Lead, Total	1	ug/l	
Lindane	0.01	ug/l	
Lithium, Total	10	ug/l	
Mercury, Total	0.5	ng/l	EPA Method 1631E
Nickel, Total	5	ug/l	
PCB-1016	0.1	ug/l	
PCB-1221	0.1	ug/l	
PCB-1232	0.1	ug/l	
PCB-1242	0.1	ug/l	
PCB-1248	0.1	ug/l	
PCB-1254	0.1	ug/l	
PCB-1260	0.1	ug/l	
Pentachlorophenol	1.8	ug/l	
Perfluorooctane sulfonate (PFOS)	2.0	ng/l	ASTM D7979 or an isotope dilution method (sometimes referred to as Method 537 modified)
Perfluorooctanoic acid (PFOA)	0.002	ug/l	ASTM D7979 or an isotope dilution method (sometimes referred to as Method 537 modified)
Phenanthrene	1.0	ug/l	
Phosphorus (as P), Total	10	ug/l	
Selenium, Total	1.0	ug/l	
Silver, Total	0.5	ug/l	
Strontium, Total	1000	ug/l	
Sulfate	2.0	mg/l	
Sulfides, Dissolved	20	ug/l	
Thallium, Total	1	ug/l	
Toxaphene	0.1	ug/l	
Vinyl Chloride	1.0	ug/l	

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7. Additional Monitoring Requirements

As a condition of this permit, the permittee shall monitor the discharge from monitoring point 001A for the constituents identified below. This monitoring is an application requirement of 40 CFR 122.21(j), effective December 2, 1999. Testing shall be conducted in October 2021, May 2022, March 2023, and August 2024. Grab samples shall be collected for total phenols and the Perfluoroalkyl and Polyfluoroalkyl Substances and Volatile Organic Compounds identified below. For all other parameters, 24-hour composite samples shall be collected.

Test species for whole effluent toxicity monitoring shall include fathead minnow **and** *Ceriodaphnia dubia,* for a total of four (4) tests on each species. Testing and reporting procedures shall follow procedures contained in EPA-821-R-02-013, "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms" (Fourth Edition). When the effluent ammonia nitrogen (as N) concentration is greater than 3 mg/l, the pH of the toxicity test shall be maintained at a pH of 8 Standard Units. Acute and chronic toxicity data shall be included in the reporting for the toxicity test results. Toxicity test data acceptability is contingent upon the validation of the test method by the testing laboratory. Such validation shall be submitted to the Department upon request. The permittee shall report to the Department any whole effluent toxicity test results greater than 1.0 TU_A or 1.0 TU_C within five (5) days of becoming aware of the result.

The results of such additional monitoring shall be submitted with the application for reissuance (see the cover page of this permit for the application due date). The permittee shall notify the Department within 14 days of completing the monitoring for each month specified above in accordance with Part II.C.5. Additional reporting requirements are specified in Part II.C.11. If, upon review of the analysis, it is determined that additional requirements are needed to protect the receiving waters in accordance with applicable water quality standards, the permit may then be modified by the Department in accordance with applicable laws and rules.

Whole Effluent Toxicity

acute toxicity	chronic toxicity

Hardness

calcium carbonate

Perfluoroalkyl and Polyfluoroalkyl Substances

Perfluorooctane Sulfonate (PFOS)	Perfluorooctanoic Acid (PFOA)

Metals (Total Recoverable) and Total Phenols

antimony	arsenic	nickel	beryllium
cadmium	chromium	zinc	copper
lead	thallium	total phenolic compounds	silver

Volatile Organic Compounds

acrolein	acrylonitrile	benzene	bromoform
carbon tetrachloride	chlorobenzene	chlorodibromomethane	chloroethane
2-chloroethylvinyl ether	chloroform	dichlorobromomethane	1,1-dichloroethane
1,2-dichloroethane	trans-1,2-dichloroethylene	1,1-dichloroethylene	1,2-dichloropropane
1,3-dichloropropylene	ethylbenzene	methyl bromide	methyl chloride
methylene chloride	1,1,2,2-tetrachloroethane	tetrachloroethylene	toluene
1,1,1-trichloroethane	1,1,2-trichloroethane	trichloroethylene	vinyl chloride

Acid-Extractable Compounds

4-chloro-3-methylphenol	2-chlorophenol	2,4-dichlorophenol	2,4-dimethylphenol
4,6-dinitro-o-cresol	2,4-dinitrophenol	2-nitrophenol	4-nitrophenol
Pentachlorophenol	phenol	2,4,6-trichlorophenol	

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Base/Neutral Compounds

acenaphthene	acenaphthylene	anthracene	benzidine
benzo(a)anthracene	benzo(a)pyrene	3,4-benzofluoranthene	benzo(ghi)perylene
benzo(k)fluoranthene	bis(2-chloroethoxy)methane	bis(2-chloroethyl)ether	bis(2-chloroisopropyl)ether
bis(2-ethylhexyl)phthalate	4-bromophenyl phenyl ether	butyl benzyl phthalate	2-chloronaphthalene
4-chlorophenyl phenyl ether	chrysene	di-n-butyl phthalate	di-n-octyl phthalate
dibenzo(a,h)anthracene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene
3,3'-dichlorobenzidine	diethyl phthalate	dimethyl phthalate	2,4-dinitrotoluene
2,6-dinitrotoluene	1,2-diphenylhydrazine	fluoranthene	fluorene
Hexachlorobenzene	hexachlorobutadiene	hexachlorocyclo-pentadiene	hexachloroethane
indeno(1,2,3-cd)pyrene	isophorone	naphthalene	nitrobenzene
n-nitrosodi-n-propylamine	n-nitrosodimethylamine	n-nitrosodiphenylamine	phenanthrene
pyrene	1,2,4-trichlorobenzene		

8. Pollutant Minimization Program for Total Mercury

The goal of the Pollutant Minimization Program is to maintain the effluent concentration of total mercury at or below 1.3 ng/l. The permittee shall continue to implement the Pollutant Minimization Program approved on April 10, 2019, and modifications thereto, to proceed toward the goal. The Pollutant Minimization Program includes the following:

a. an annual review and semi-annual monitoring of potential sources of mercury entering the wastewater collection system;

b. a program for quarterly monitoring of influent and periodic monitoring of sludge for mercury; and

c. implementation of reasonable cost-effective control measures when sources of mercury are discovered. Factors to be considered include significance of sources, economic considerations, and technical and treatability considerations.

On or before March 31 of each year, the permittee shall submit a status report to the Department for the previous calendar year that includes 1) the monitoring results for the previous year, 2) an updated list of potential mercury sources, and 3) a summary of all actions taken to reduce or eliminate identified sources of mercury.

Any information generated as a result of the Pollutant Minimization Program set forth in this permit may be used to support a request to modify the approved program or to demonstrate that the Pollutant Minimization Program requirement has been completed satisfactorily.

A request for modification of the approved program and supporting documentation shall be submitted in writing to the Department for review and approval. The Department may approve modifications to the approved program (approval of a program modification does not require a permit modification), including a reduction in the frequency of the requirements under items a. and b. above.

This permit may be modified in accordance with applicable laws and rules to include additional mercury conditions and/or limitations as necessary.

PART I

Section A. Limitations and Monitoring Requirements

9. Untreated or Partially Treated Sewage Discharge Reporting and Testing Requirements

In accordance with Section 324.3112a of the NREPA, if untreated or partially treated sewage is directly or indirectly discharged from a sewer system onto land or into the waters of the state, the permittee shall immediately, but not more than 24 hours after the discharge begins, notify local health departments, a daily newspaper of general circulation in the county in which the permittee is located, and a daily newspaper of general circulation in the county or counties in which the municipalities whose waters may be affected by the discharge are located, that the discharge is occurring. The permittee shall also notify the Department via its MiWaters system on the form entitled "Report of Discharge (CSO\SSO\RTB)." The MiWaters website is located at https://miwaters.deq.state.mi.us. At the conclusion of the discharge, the permittee shall make all such notifications specified in, and in accordance with, Section 324.3112a of the NREPA, and shall notify the Department via its MiWaters system on the form entitled "Report of Discharge (CSO\SSO\RTB)."

In the event of a combined sewer overflow (CSO) and/or retention treatment basin (RTB) discharge, the permittee shall, in accordance with the public notification plan approved by the Department, notify the Department, the local health departments, a daily newspaper of general circulation in the county in which the permittee is located, and a daily newspaper of general circulation in the county or counties in which the municipalities whose waters may be affected by the discharge are located. Notification that the discharge is occurring shall be made within four (4) hours of becoming aware of the discharge. Within seven (7) days of becoming aware of the conclusion of the discharge, the permittee shall, in accordance with the public notification plan approved by the Department, provide written notification to the above parties of the following:

1) the amount of discharge as measured in accordance with the procedures approved by the Department,

2) the reason for the discharge,

3) the time the discharge began and ended as measured in accordance with the procedures approved by the Department, and

4) verification that the permittee is in compliance with the requirements of this permit. If such verification cannot be made, an explanation shall be provided detailing the reasons why the permittee is not in compliance with the requirements of this permit.

On or before April 4, 2025, with the application for reissuance, the permittee shall submit to the Department for approval an updated public notification plan.

Permittees authorized to discharge CSOs and/or RTB discharges to the Great Lakes Basin shall provide public notification of these discharges in accordance with 40 CFR 122.38 and the approved public notification plan. Such permittees shall, in accordance with Section 324.3112a of the NREPA, also provide notification to a newspaper of general circulation in the county in which the discharge occurred or is occurring.

The permittee shall also annually contact municipalities, including the superintendent of a public drinking water supply with potentially affected intakes, whose waters may be affected by the permittee's discharge of untreated or partially treated sewage, and if those municipalities wish to be notified in the same manner as specified above, the permittee shall provide such notification.

Additionally, in accordance with Section 324.3112a of the NREPA, each time a discharge of untreated or partially treated sewage occurs, the permittee shall test the affected waters for *Escherichia coli* to assess the risk to the public health as a result of the discharge and shall provide the test results to the affected local county health departments and to the Department. The results of this testing shall be submitted to the Department via MiWaters as part of the notification specified above, or, if the results are not yet available, submitted as soon as they become available. This testing is not required if it has been waived by the local health department, or if the discharge(s) did not affect surface waters. The testing shall be done at locations specified by each affected

PART I

Section A. Limitations and Monitoring Requirements

local county health department but shall not exceed 10 tests for each separate discharge event. The affected local county health department may waive this testing requirement if it determines that such testing is not needed to assess the risk to the public health as a result of the discharge event.

Permittees accepting sanitary or municipal sewage from other sewage collection systems are encouraged to notify the owners of those systems of the above reporting and testing requirements.

10. Facility Contact

The "Facility Contact" was specified in the application. The permittee may replace the facility contact at any time, and shall notify the Department in writing within 10 days after replacement (including the name, address and telephone number of the new facility contact).

a. The facility contact shall be (or a duly authorized representative of this person):
   - for a corporation, a principal executive officer of at least the level of vice president; or a designated representative if the representative is responsible for the overall operation of the facility from which the discharge originates, as described in the permit application or other NPDES form,
   - for a partnership, a general partner,
   - for a sole proprietorship, the proprietor, or
   - for a municipal, state, or other public facility, either a principal executive officer, the mayor, village president, city or village manager or other duly authorized employee.

b. A person is a duly authorized representative only if:
   - the authorization is made in writing to the Department by a person described in paragraph a. of this section; and
   - the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the facility (a duly authorized representative may thus be either a named individual or any individual occupying a named position).

Nothing in this section releases the permittee from properly submitting reports and forms as required by law.

11. Monthly Operating Reports

Part 41 of Act 451 of 1994 as amended, specifically Section 324.4106 and associated R 299.2953, requires that the permittee file with the Department, on forms prescribed by the Department, operating reports showing the effectiveness of the treatment facility operation and the quantity and quality of liquid wastes discharged into waters of the state.

Within 30 days of the effective date of this permit, the permittee shall submit to the Department a revised treatment facility monitoring program to address monitoring requirement changes reflected in this permit, or submit justification explaining why monitoring requirement changes reflected in this permit do not necessitate revisions to the treatment facility monitoring program. The permittee shall implement the revised treatment facility monitoring program upon approval from the Department. Applicable forms and guidance are available on the Department's web site at https://www.michigan.gov/egle/0,9429,7-135-3313_71618_44117---,00.html. The permittee may use alternate forms if they are consistent with the approved treatment facility monitoring program. Unless the Department provides written notification to the permittee that monthly submittal of operating reports is required, operating reports that result from implementation of the approved treatment facility monitoring program shall be maintained on site for a minimum of three (3) years and shall be made available to the Department for review upon request.

PART I

Section A. Limitations and Monitoring Requirements

12. Asset Management

The permittee shall at all times properly operate and maintain all facilities (i.e., the sewer system and treatment works as defined in Part 41 of the NREPA), and control systems installed or used by the permittee to operate the sewer system and treatment works and achieve and maintain compliance with the conditions of this permit (also see Part II.D.3 of this permit). The requirements of an Asset Management Program function to achieve the goals of effective performance, adequate funding, and adequate operator staffing and training. Asset management is a planning process for ensuring that optimum value is gained for each asset and that financial resources are available to rehabilitate and replace those assets when necessary. Asset management is centered on a framework of five (5) core elements: the current state of the assets; the required sustainable level of service; the assets critical to sustained performance; the minimum life-cycle costs; and the best long-term funding strategy.

a. Asset Management Program Requirements
The permittee shall continue to implement the Asset Management Plan approved on July 5, 2018, and approved modifications thereto. The Asset Management Plan contains a schedule for the development and implementation of an Asset Management Program that meets the requirements outlined below in 1) – 4):

1) *Maintenance Staff.* The permittee shall provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit. The level of staffing needed shall be determined by taking into account the work involved in operating the sewer system and treatment works, planning for and conducting maintenance, and complying with this permit.

2) *Collection System Map.* The permittee shall complete a map of the sewer collection system it owns and operates. The map shall be of sufficient detail and at a scale to allow easy interpretation. The collection system information shown on the map shall be based on current conditions and shall be kept up-to-date and available for review by the Department. **Note: Items below referencing combined sewer systems are not applicable to separate sewer systems.** Such map(s) shall include but not be limited to the following:

a) all sanitary sewer lines and related manholes;

b) all combined sewer lines, related manholes, catch basins and CSO regulators;

c) all known or suspected connections between the sanitary sewer or combined sewer and storm drain systems;

d) all outfalls, including the treatment plant outfall(s), combined sewer treatment facility outfalls, untreated CSOs, and any known SSOs;

e) all pump stations and force mains;

f) the wastewater treatment facility(ies), including all treatment processes;

g) all surface waters (labeled);

h) other major appurtenances such as inverted siphons and air release valves;

i) a numbering system which uniquely identifies manholes, catch basins, overflow points, regulators and outfalls;

j) the scale and a north arrow;

PART I

Section A. Limitations and Monitoring Requirements

k) the pipe diameter, date of installation, type of material, distance between manholes, and the direction of flow; and

l) the manhole interior material, rim elevation (optional), and invert elevations.

3) *Inventory and assessment of fixed assets.* The permittee shall complete an inventory and assessment of operations-related fixed assets including portions of the collection system owned and operated by the permittee. Fixed assets are assets that are normally stationary (e.g., pumps, blowers, buildings, manholes, and sewer lines). The inventory and assessment shall be based on current conditions and shall be kept up-to-date and available for review by the Department.

a) The fixed asset inventory shall include the following:

(1) a brief description of the fixed asset, its design capacity (e.g., pump: 120 gallons per minute), its level of redundancy, and its tag number if applicable;

(2) the location of the fixed asset;

(3) the year the fixed asset was installed;

(4) the present condition of the fixed asset (e.g., excellent, good, fair, poor); and

(5) the current fixed asset (replacement) cost in dollars for year specified in accordance with approved schedules;

b) The fixed asset assessment shall include a "Business Risk Evaluation" that combines the probability of failure of the fixed asset and the criticality of the fixed asset, as follows:

(1) Rate the probability of failure of the fixed asset on a scale of 1-5 (low to high) using criteria such as maintenance history, failure history, and remaining percentage of useful life (or years remaining);

(2) Rate the criticality of the fixed asset on a scale of 1-5 (low to high) based on the consequence of failure versus the desired level of service for the facility; and

(3) Compute the Business Risk Factor of the fixed asset by multiplying the failure rating from (1) by the criticality rating from (2).

4) *Operation, Maintenance & Replacement (OM&R) Budget and Rate Sufficiency for the Sewer System and Treatment Works.* The permittee shall complete an assessment of its user rates and replacement fund, including the following:

a) beginning and end dates of fiscal year;

b) name of the department, committee, board, or other organization that sets rates for the operation of the sewer system and treatment works;

c) amount in the permittee's replacement fund in dollars for year specified in accordance with approved schedules;

d) replacement fund strategy of all assets with a useful life of 20 years or less;

PART I

Section A. Limitations and Monitoring Requirements

e) expenditures for maintenance, corrective action and capital improvement taken during the fiscal year;

f) OM&R budget for the fiscal year; and

g) rate calculation demonstrating sufficient revenues to cover OM&R expenses. If the rate calculation shows there are insufficient revenues to cover OM&R expenses, the permittee shall document, within three (3) fiscal years after submittal of the Asset Management Plan, that there is at least one rate adjustment that reduces the revenue gap by at least 10 percent. The permittee may prepare and submit an alternate plan, subject to Department approval, for addressing the revenue gap. The ultimate goal of the Asset Management Program is to ensure sufficient revenues to cover OM&R expenses.

b. Annual Reporting

The permittee shall develop a written report that summarizes asset management activities completed during the previous year and planned for the upcoming year. The written report shall be submitted to the Department on or before August 1 of each year. The written report shall include:

1) a description of the staffing levels maintained during the year;

2) a description of inspections and maintenance activities conducted and corrective actions taken during the previous year;

3) expenditures for collection system maintenance activities, treatment works maintenance activities, corrective actions, and capital improvement during the previous year;

4) a summary of assets/areas identified for inspection/action (including capital improvement) in the upcoming year based on the five (5) core elements and the Business Risk Factors computed in accordance with condition a.3)b)(3) above;

5) a maintenance budget and capital improvement budget for the upcoming year that take into account implementation of an effective Asset Management Program that meets the five (5) core elements;

6) an updated asset inventory based on the original submission; and

7) an updated OM&R budget with an updated rate schedule that includes the amount of insufficient revenues, if any.

PART I

Section A. Limitations and Monitoring Requirements

13. Discharge Monitoring Report – Quality Assurance Study Program

The permittee shall participate in the Discharge Monitoring Report – Quality Assurance (DMR-QA) Study Program. The purpose of the DMR-QA Study Program is to annually evaluate the proficiency of all in-house and/or contract laboratory(ies) that perform, on behalf of the facility authorized to discharge under this permit, the analytical testing required under this permit. In accordance with Section 308 of the Clean Water Act (33 U.S.C. § 1318); and R 323.2138 and R 323.2154 of Part 21, Wastewater Discharge Permits, promulgated under Part 31 of the NREPA, participation in the DMR-QA Study Program is required for all major facilities, and for minor facilities selected for participation by the Department.

Annually and in accordance with DMR-QA Study Program requirements and submittal due dates, the permittee shall submit to the Michigan DMR-QA Study Program state coordinator all documentation required by the DMR-QA Study. DMR-QA Study Program participation is required only for the analytes required under this permit and only when those analytes are also identified in the DMR-QA Study.

If the permitted facility's status as a major facility should change, participation in the DMR-QA Study Program may be reevaluated. Questions concerning participation in the DMR-QA Study Program should be directed to the Michigan DMR-QA Study Program state coordinator.

All forms and instructions required for participation in the DMR-QA Study Program, including submittal due dates and state coordinator contact information, can be found at http://www.epa.gov/compliance/discharge-monitoring-report-quality-assurance-study-program.

14. Continuous Monitoring

If continuous monitoring equipment is used and becomes temporarily inoperable, the permittee shall manually obtain a minimum of three (3) equally spaced grab samples/readings within each 24-hour period for the affected parameter(s). On such days, in the comment field on the Daily tab of the DMR, the permittee shall indicate "continuous monitoring system inoperable," the date on which the system is expected to become operable again, and the number of samples/readings obtained during each 24-hour period.

PART I

Section B. Storm Water Pollution Prevention

Section B. Storm Water Pollution Prevention is not required for this permit.

PART I

Section C. Industrial Waste Pretreatment Program

1. Federal Industrial Pretreatment Program

a. The permittee shall implement the Federal Industrial Pretreatment Program (FIPP) approved on September 30, 1985, and any subsequent modifications approved up to the issuance of this permit. Approval of substantial program modifications after the issuance of this permit shall be incorporated into this permit by minor modification in accordance with 40 CFR 122.63.

b. The permittee shall comply with R 323.2301 through R 323.2317 of the Michigan Administrative Code (Part 23 Rules), the General Pretreatment Regulations for Existing and New Sources of Pollution (40 CFR Part 403), and the approved FIPP.

c. The permittee shall have the legal authority and necessary interjurisdictional agreements that provide the basis for the implementation and enforcement of the approved FIPP throughout the service area. The legal authority and necessary interjurisdictional agreements shall include, at a minimum, the authority to carry out the activities specified in R 323.2306(a).

d. The permittee shall develop procedures which describe, in sufficient detail, program commitments which enable implementation of the approved FIPP, 40 CFR Part 403, and the Part 23 Rules in accordance with R 323.2306(c).

e. The permittee shall establish an interjurisdictional agreement (or comparable document) with all tributary governmental jurisdictions. Each interjurisdictional agreement shall contain, at a minimum, the following:

1) identification of the agency responsible for the implementation and enforcement of the approved FIPP within the tributary governmental jurisdiction's boundaries; and

2) the provision of the legal authority which provides the basis for the implementation and enforcement of the approved FIPP within the tributary governmental jurisdiction's boundaries.

f. The permittee shall prohibit discharges that:

1) cause, in whole or in part, the permittee's failure to comply with any condition of this permit or the NREPA;

2) restrict, in whole or in part, the permittee's management of biosolids;

3) cause, in whole or in part, operational problems at the treatment facility or in its collection system;

4) violate any of the general or specific prohibitions identified in R 323.2303(1) and (2);

5) violate categorical standards identified in R 323.2311; and

6) violate local limits established in accordance with R 323.2303(4).

g. The permittee shall maintain a list of its nondomestic users that meet the criteria of a significant industrial user as identified in R 323.2302(cc).

h. The permittee shall develop an enforcement response plan which describes, in sufficient detail, program commitments which will enable the enforcement of the approved FIPP, 40 CFR Part 403, and the Part 23 Rules in accordance with R 323.2306(g).

PART I

Section C. Industrial Waste Pretreatment Program

i. The Department may require modifications to the approved FIPP which are necessary to ensure compliance with 40 CFR Part 403 and the Part 23 Rules in accordance with R 323.2309.

j. The permittee shall not implement changes or modifications to the approved FIPP without notification to the Department. Any substantial modification shall be subject to Department public noticing and approval in accordance with R 323.2309.

k. The permittee shall maintain an adequate revenue structure and staffing level for effective implementation of the approved FIPP.

l. The permittee shall develop and maintain, for a minimum of three (3) years, all records and information necessary to determine nondomestic user compliance with 40 CFR Part 403, Part 23 Rules and the approved FIPP. This period of retention shall be extended during the course of any unresolved enforcement action or litigation regarding a nondomestic user or when requested by the Department or the United States Environmental Protection Agency. All of the aforementioned records and information shall be made available upon request for inspection and copying by the Department and the United States Environmental Protection Agency.

m. The permittee shall evaluate the approved FIPP for compliance with the 40 CFR Part 403, Part 23 Rules and the prohibitions stated in item f. above. Based upon this evaluation, the permittee shall propose to the Department all necessary changes or modifications to the approved FIPP no later than the next Industrial Pretreatment Program Annual Report due date (see item p. below).

n. The permittee shall develop and enforce local limits to implement the prohibitions listed in item f above. Local limits shall be based upon data representative of actual conditions demonstrated in a maximum allowable headworks loading analysis. An evaluation of whether the existing local limits need to be revised shall be submitted to the Department by August 1, 2022. The submittal shall provide a technical evaluation of the basis upon which this determination was made which includes information regarding the maximum allowable headworks loading, collection system protection criteria, and worker health and safety, based upon data collected since the last local limits review.

The following pollutants shall be evaluated:

1) Arsenic, Cadmium, Chromium, Copper, Cyanide, Lead, Mercury, Nickel, Silver, and Zinc;

2) Pollutants that are subject to limits or monitoring in this permit;

3) Pollutants that have an existing local limit; and,

4) Other pollutants of concern which would reasonably be expected to be discharged or transported by truck or rail or otherwise introduced into the POTW.

PART I

Section C. Industrial Waste Pretreatment Program

o. The permittee is required under this permit and R 323.2303(4) of the Michigan Administrative Code to review and update their local limits when:

1) new pollutants are introduced;

2) new pollutants that were previously unevaluated are identified;

3) new water quality or biosolids standards are established or additional information becomes available about the nature of pollutants, such as removal rates and accumulation in biosolids; or

4) substantial increases of pollutants are proposed as required in the notification of new or increased uses in accordance with the provisions of 40 CFR 122.42.

p. On or before April 1 of each year, the permittee shall submit to the Department, as required by R 323.2310(8), an Industrial Pretreatment Program Annual Report on the status of program implementation and enforcement activities. The reporting period shall begin on January 1 and end on December 31. At a minimum, the Industrial Pretreatment Program Annual Report shall include:

1) the Pretreatment Program Reports data identified in Appendix A to 40 CFR Part 127 – NPDES Electronic Reporting;

2) a summary of changes to the approved FIPP that have not been previously reported to the Department;

3) a summary of results of all the sampling and analyses performed of the wastewater treatment plant's influent, effluent, and biosolids conducted in accordance with approved methods during the reporting period. The summary shall include the monthly average, daily maximum, quantification level, and number of samples analyzed for each pollutant. At a minimum, the results of analyses for all locally limited parameters for at least one monitoring event that tests influent, effluent and biosolids during the reporting period shall be submitted with each report, unless otherwise required by the Department. Sample collection shall be at intervals sufficient to provide pollutant removal rates, unless the pollutant is not measurable; and

4) any other relevant information requested by the Department.

PART I

Section D. Residuals Management Program

1. Residuals Management Program for Land Application of Biosolids

The permittee is authorized to land-apply bulk biosolids or prepare bulk biosolids for land application in accordance with the permittee's approved Residuals Management Program (RMP) approved on February 9, 2001, and approved modifications thereto, and the requirements established in R 323.2401 through R 323.2418 of the Michigan Administrative Code (Part 24 Rules). The approved RMP, and any approved modifications thereto, are enforceable requirements of this permit. Incineration, landfilling and other residual disposal activities shall be conducted in accordance with Part II.D.7. of this permit. The Part 24 Rules can be obtained via the internet (http://www.michigan.gov/egle/ and near the top of the screen click on Water, then towards the bottom right of the screen click on Permits, Wastewater, Biosolids, then click on Biosolids Laws and Rules Information which is under the Laws & Rules banner in the center of the screen).

a. Annual Report
On or before October 30 of each year, the permittee shall submit an annual report to the Department for the previous fiscal year of October 1 through September 30. The report shall be submitted electronically via the Department's MiWaters system at https://miwaters.deq.state.mi.us. At a minimum, the report shall contain:

1) a certification that current residuals management practices are in accordance with the approved RMP, or a proposal for modification to the approved RMP; and

2) a completed Annual Report Form for Reporting Biosolids, available at https://miwaters.deq.state.mi.us.

b. Modifications to the Approved RMP
Prior to implementation of modifications to the RMP, the permittee shall submit proposed modifications to the Department for approval. The approved modification shall become effective upon the date of approval. Upon written notification, the Department may impose additional requirements and/or limitations to the approved RMP as necessary to protect public health and the environment from any adverse effect of a pollutant in the biosolids.

c. Record Keeping
Records required by the Part 24 Rules shall be kept for a minimum of five (5) years. However, the records documenting cumulative loading for sites subject to cumulative pollutant loading rates shall be kept as long as the site receives biosolids.

d. Contact Information
RMP-related submittals shall be made to the Department.

PART II

Part II may include terms and /or conditions not applicable to discharges covered under this permit.

Section A. Definitions

Acute toxic unit (TU_A) means $100/LC_{50}$ where the LC_{50} is determined from a whole effluent toxicity (WET) test which produces a result that is statistically or graphically estimated to be lethal to 50% of the test organisms.

Annual monitoring frequency refers to a calendar year beginning on January 1 and ending on December 31. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Authorized public agency means a state, local, or county agency that is designated pursuant to the provisions of Section 9110 of Part 91, Soil and Sedimentation Control, of the NREPA, to implement soil erosion and sedimentation control requirements with regard to construction activities undertaken by that agency.

Best management practices (BMPs) means structural devices or nonstructural practices that are designed to prevent pollutants from entering into storm water, to direct the flow of storm water, or to treat polluted storm water.

Bioaccumulative chemical of concern (BCC) means a chemical which, upon entering the surface waters, by itself or as its toxic transformation product, accumulates in aquatic organisms by a human health bioaccumulation factor of more than 1000 after considering metabolism and other physiochemical properties that might enhance or inhibit bioaccumulation. The human health bioaccumulation factor shall be derived according to R 323.1057(5). Chemicals with half-lives of less than 8 weeks in the water column, sediment, and biota are not BCCs. The minimum bioaccumulation concentration factor (BAF) information needed to define an organic chemical as a BCC is either a field-measured BAF or a BAF derived using the biota-sediment accumulation factor (BSAF) methodology. The minimum BAF information needed to define an inorganic chemical as a BCC, including an organometal, is either a field-measured BAF or a laboratory-measured bioconcentration factor (BCF). The BCCs to which these rules apply are identified in Table 5 of R 323.1057 of the Water Quality Standards.

Biosolids are the solid, semisolid, or liquid residues generated during the treatment of sanitary sewage or domestic sewage in a treatment works. This includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes and a derivative of the removed scum or solids.

Bulk biosolids means biosolids that are not sold or given away in a bag or other container for application to a lawn or home garden.

Certificate of Coverage (COC) is a document, issued by the Department, which authorizes a discharge under a general permit.

Chronic toxic unit (TU_C) means 100/MATC or $100/IC_{25}$, where the maximum acceptable toxicant concentration (MATC) and IC_{25} are expressed as a percent effluent in the test medium.

Class B biosolids refers to material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PSRP) in accordance with the Part 24 Rules, Land Application of Biosolids, promulgated under Part 31 of the NREPA. Processes include aerobic digestion, composting, anaerobic digestion, lime stabilization and air drying.

Combined sewer system is a sewer system in which storm water runoff is combined with sanitary wastes.

Composite sample is a sample collected over time, either by continuous sampling or by mixing discrete samples. A composite sample represents the average wastewater characteristics during the compositing period. Various methods for compositing are available and are based on either time or flow-proportioning, the choice of which will depend on the permit requirements.

PART II

Section A. Definitions

Continuous monitoring refers to sampling/readings that occur at regular and consistent intervals throughout a 24-hour period and at a frequency sufficient to capture data that are representative of the discharge. The maximum acceptable interval between samples/readings shall be one (1) hour.

Daily concentration
FOR PARAMETERS OTHER THAN pH, DISSOLVED OXYGEN, TEMPERATURE, AND CONDUCTIVITY – Daily concentration is the sum of the concentrations of the individual samples of a parameter taken within a calendar day divided by the number of samples taken within that calendar day. The daily concentration will be used to determine compliance with any maximum and minimum daily concentration limitations. For guidance and examples showing how to perform calculations using results below quantification levels, see the document entitled "Reporting Results Below Quantification," available at https://www.michigan.gov/documents/deq/wrd-npdes-results-quantification_620791_7.pdf.

FOR pH, DISSOLVED OXYGEN, TEMPERATURE, AND CONDUCTIVITY – The daily concentration used to determine compliance with maximum daily pH, temperature, and conductivity limitations is the highest pH, temperature, and conductivity readings obtained within a calendar day. The daily concentration used to determine compliance with minimum daily pH and dissolved oxygen limitations is the lowest pH and dissolved oxygen readings obtained within a calendar day.

Daily loading is the total discharge by weight of a parameter discharged during any calendar day. This value is calculated by multiplying the daily concentration by the total daily flow and by the appropriate conversion factor. The daily loading will be used to determine compliance with any maximum daily loading limitations. When required by the permit, report the maximum calculated daily loading for the month in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMRs.

Daily monitoring frequency refers to a 24-hour day. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Department means the Michigan Department of Environment, Great Lakes, and Energy.

Detection level means the lowest concentration or amount of the target analyte that can be determined to be different from zero by a single measurement at a stated level of probability.

Discharge means the addition of any waste, waste effluent, wastewater, pollutant, or any combination thereof to any surface water of the state.

EC_{50} means a statistically or graphically estimated concentration that is expected to cause 1 or more specified effects in 50% of a group of organisms under specified conditions.

PART II

Section A. Definitions

Fecal coliform bacteria monthly
FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – Fecal coliform bacteria monthly is the geometric mean of all daily concentrations determined during a discharge event. Days on which no daily concentration is determined shall not be used to determine the calculated monthly value. The calculated monthly value will be used to determine compliance with the maximum monthly fecal coliform bacteria limitations. When required by the permit, report the calculated monthly value in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMR. If the period in which the discharge event occurred was partially in each of two months, the calculated monthly value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – Fecal coliform bacteria monthly is the geometric mean of all daily concentrations determined during a reporting month. Days on which no daily concentration is determined shall not be used to determine the calculated monthly value. The calculated monthly value will be used to determine compliance with the maximum monthly fecal coliform bacteria limitations. When required by the permit, report the calculated monthly value in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMR.

Fecal coliform bacteria 7-day
FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – Fecal coliform bacteria 7-day is the geometric mean of the daily concentrations determined during any 7 consecutive days of discharge during a discharge event. If the number of daily concentrations determined during the discharge event is less than 7 days, the number of actual daily concentrations determined shall be used for the calculation. Days on which no daily concentration is determined shall not be used to determine the value. The calculated 7-day value will be used to determine compliance with the maximum 7-day fecal coliform bacteria limitations. When required by the permit, report the maximum calculated 7-day geometric mean value for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs. If the 7-day period was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – Fecal coliform bacteria 7-day is the geometric mean of the daily concentrations determined during any 7 consecutive days in a reporting month. If the number of daily concentrations determined is less than 7, the actual number of daily concentrations determined shall be used for the calculation. Days on which no daily concentration is determined shall not be used to determine the value. The calculated 7-day value will be used to determine compliance with the maximum 7-day fecal coliform bacteria limitations. When required by the permit, report the maximum calculated 7-day geometric mean for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs. The first calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

Flow-proportioned composite sample is a composite sample in which the volume of each portion of the composite is proportional to the effluent flow rate at the time that portion is obtained.

General permit means an NPDES permit authorizing a category of similar discharges.

Geometric mean is the average of the logarithmic values of a base 10 data set, converted back to a base 10 number.

Grab sample is a single sample taken at neither a set time nor flow.

IC_{25} means the toxicant concentration that would cause a 25% reduction in a nonquantal biological measurement for the test population.

PART II

Section A. Definitions

Illicit connection means a physical connection to a municipal separate storm sewer system that primarily conveys non-storm water discharges other than uncontaminated groundwater into the storm sewer; or a physical connection not authorized or permitted by the local authority, where a local authority requires authorization or a permit for physical connections.

Illicit discharge means any discharge to, or seepage into, a municipal separate storm sewer system that is not composed entirely of storm water or uncontaminated groundwater. Illicit discharges include non-storm water discharges through pipes or other physical connections; dumping of motor vehicle fluids, household hazardous wastes, domestic animal wastes, or litter; collection and intentional dumping of grass clippings or leaf litter; or unauthorized discharges of sewage, industrial waste, restaurant wastes, or any other non-storm water waste directly into a separate storm sewer.

Individual permit means a site-specific NPDES permit.

Inlet means a catch basin, roof drain, conduit, drain tile, retention pond riser pipe, sump pump, or other point where storm water or wastewater enters into a closed conveyance system prior to discharge off site or into waters of the state.

Interference is a discharge which, alone or in conjunction with a discharge or discharges from other sources, both: 1) inhibits or disrupts a POTW, its treatment processes or operations, or its sludge processes, use or disposal; and 2) therefore, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or, of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent state or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including state regulations contained in any state sludge management plan prepared pursuant to Subtitle D of the SWDA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act. [This definition does not apply to sample matrix interference].

Land application means spraying or spreading biosolids or a biosolids derivative onto the land surface, injecting below the land surface, or incorporating into the soil so that the biosolids or biosolids derivative can either condition the soil or fertilize crops or vegetation grown in the soil.

LC_{50} means a statistically or graphically estimated concentration that is expected to be lethal to 50% of a group of organisms under specified conditions.

Maximum acceptable toxicant concentration (MATC) means the concentration obtained by calculating the geometric mean of the lower and upper chronic limits from a chronic test. A lower chronic limit is the highest tested concentration that did not cause the occurrence of a specific adverse effect. An upper chronic limit is the lowest tested concentration which did cause the occurrence of a specific adverse effect and above which all tested concentrations caused such an occurrence.

Maximum extent practicable means implementation of best management practices by a public body to comply with an approved storm water management program as required by a national permit for a municipal separate storm sewer system, in a manner that is environmentally beneficial, technically feasible, and within the public body's legal authority.

MBTU/hr means million British Thermal Units per hour.

MGD means million gallons per day.

PART II

Section A. Definitions

Monthly concentration is the sum of the daily concentrations determined during a reporting period divided by the number of daily concentrations determined. The calculated monthly concentration will be used to determine compliance with any maximum monthly concentration limitations. Days with no discharge shall not be used to determine the value. When required by the permit, report the calculated monthly concentration in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMR.

For minimum percent removal requirements, the monthly influent concentration and the monthly effluent concentration shall be determined. The calculated monthly percent removal, which is equal to 100 times the quantity [1 minus the quantity (monthly effluent concentration divided by the monthly influent concentration)], shall be reported in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

Monthly loading is the sum of the daily loadings of a parameter divided by the number of daily loadings determined during a reporting period. The calculated monthly loading will be used to determine compliance with any maximum monthly loading limitations. Days with no discharge shall not be used to determine the value. When required by the permit, report the calculated monthly loading in the "AVERAGE" column under "QUANTITY OR LOADING" on the DMR.

Monthly monitoring frequency refers to a calendar month. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Municipal separate storm sewer means a conveyance or system of conveyances designed or used for collecting or conveying storm water which is not a combined sewer and which is not part of a POTW as defined in the Code of Federal Regulations at 40 CFR 122.2.

Municipal separate storm sewer system (MS4) means all separate storm sewers that are owned or operated by the United States, a state, city, village, township, county, district, association, or other public body created by or pursuant to state law, having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under state law, such as a sewer district, flood control district, or drainage district, or similar entity, or a designated or approved management agency under Section 208 of the Clean Water Act that discharges to the waters of the state. This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings.

National Pretreatment Standards are the regulations promulgated by or to be promulgated by the Federal Environmental Protection Agency pursuant to Section 307(b) and (c) of the Clean Water Act. The standards establish nationwide limits for specific industrial categories for discharge to a POTW.

No observed adverse effect level (NOAEL) means the highest tested dose or concentration of a substance which results in no observed adverse effect in exposed test organisms where higher doses or concentrations result in an adverse effect.

Noncontact cooling water is water used for cooling which does not come into direct contact with any raw material, intermediate product, by-product, waste product or finished product.

Nondomestic user is any discharger to a POTW that discharges wastes other than or in addition to water-carried wastes from toilet, kitchen, laundry, bathing or other facilities used for household purposes.

Nonstructural controls are practices or procedures implemented by employees at a facility to manage storm water or to prevent contamination of storm water.

NPDES means National Pollutant Discharge Elimination System.

Outfall is the location at which a point source discharge first enters a surface water of the state.

PART II

Section A. Definitions

Part 91 agency means an agency that is designated by a county board of commissioners pursuant to the provisions of Section 9105 of Part 91 of the NREPA; an agency that is designated by a city, village, or township in accordance with the provisions of Section 9106 of Part 91 of the NREPA; or the Department for soil erosion and sedimentation control activities under Part 615, Supervisor of Wells; Part 631, Reclamation of Mining Lands; or Part 632, Nonferrous Metallic Mineral Mining, of the NREPA, pursuant to the provisions of Section 9115 of Part 91 of the NREPA.

Part 91 permit means a soil erosion and sedimentation control permit issued by a Part 91 agency pursuant to the provisions of Part 91 of the NREPA.

Partially treated sewage is any sewage, sewage and storm water, or sewage and wastewater, from domestic or industrial sources that is treated to a level less than that required by the permittee's NPDES permit, or that is not treated to national secondary treatment standards for wastewater, including discharges to surface waters from retention treatment facilities.

Point of discharge is the location of a point source discharge where storm water is discharged directly into a separate storm sewer system.

Point source discharge means a discharge from any discernible, confined, discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, or rolling stock. Changing the surface of land or establishing grading patterns on land will result in a point source discharge where the runoff from the site is ultimately discharged to waters of the state.

Polluting material means any material, in solid or liquid form, identified as a polluting material under the Part 5 Rules, Spillage of Oil and Polluting Materials, promulgated under Part 31 of the NREPA (R 324.2001 through R 324.2009 of the Michigan Administrative Code).

POTW is a publicly owned treatment work.

Predevelopment is the last land use prior to the planned new development or redevelopment.

Pretreatment is reducing the amount of pollutants, eliminating pollutants, or altering the nature of pollutant properties to a less harmful state prior to discharge into a public sewer. The reduction or alteration can be by physical, chemical, or biological processes, process changes, or by other means. Dilution is not considered pretreatment unless expressly authorized by an applicable National Pretreatment Standard for a particular industrial category.

Public (as used in the MS4 individual permit) means all persons who potentially could affect the authorized storm water discharges, including, but not limited to, residents, visitors to the area, public employees, businesses, industries, and construction contractors and developers.

Public body means the United States; the state of Michigan; a city, village, township, county, school district, public college or university, or single-purpose governmental agency; or any other body which is created by federal or state statute or law.

Qualified Personnel means an individual who meets qualifications acceptable to the Department and who is authorized by an Industrial Storm Water Certified Operator to collect the storm water sample.

PART II

Section A. Definitions

Qualifying storm event means a storm event causing greater than 0.1 inch of rainfall and occurring at least 72 hours after the previous measurable storm event that also caused greater than 0.1 inch of rainfall. Upon request, the Department may approve an alternate definition meeting the condition of a qualifying storm event.

Quantification level means the measurement of the concentration of a contaminant obtained by using a specified laboratory procedure calculated at a specified concentration above the detection level. It is considered the lowest concentration at which a particular contaminant can be quantitatively measured using a specified laboratory procedure for monitoring of the contaminant.

Quarterly monitoring frequency refers to a three month period, defined as January through March, April through June, July through September, and October through December. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Regional Administrator is the Region 5 Administrator, U.S. EPA, located at R-19J, 77 W. Jackson Blvd., Chicago, Illinois 60604.

Regulated area means the permittee's urbanized area, where urbanized area is defined as a place and its adjacent densely-populated territory that together have a minimum population of 50,000 people as defined by the United States Bureau of the Census and as determined by the latest available decennial census.

Secondary containment structure means a unit, other than the primary container, in which significant materials are packaged or held, which is required by state or federal law to prevent the escape of significant materials by gravity into sewers, drains, or otherwise directly or indirectly into any sewer system or to the surface waters or groundwaters of the state.

Separate storm sewer system means a system of drainage, including, but not limited to, roads, catch basins, curbs, gutters, parking lots, ditches, conduits, pumping devices, or man-made channels, which is not a combined sewer where storm water mixes with sanitary wastes, and is not part of a POTW.

Significant industrial user is a nondomestic user that: 1) is subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; or 2) discharges an average of 25,000 gallons per day or more of process wastewater to a POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process waste stream which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the permittee as defined in 40 CFR 403.12(a) on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's treatment plant operation or violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Significant materials means any material which could degrade or impair water quality, including but not limited to: raw materials; fuels; solvents, detergents, and plastic pellets; finished materials such as metallic products; hazardous substances designated under Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (see 40 CFR 372.65); any chemical the facility is required to report pursuant to Section 313 of Emergency Planning and Community Right-to-Know Act (EPCRA); polluting materials as identified under the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code); Hazardous Wastes as defined in Part 111, Hazardous Waste Management, of the NREPA; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges.

Significant spills and significant leaks means any release of a polluting material reportable under the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code).

PART II

Section A. Definitions

Special-use area means storm water discharges for which the Department has determined that additional monitoring is needed from: secondary containment structures required by state or federal law; lands on Michigan's List of Sites of Environmental Contamination pursuant to Part 201, Environmental Remediation, of the NREPA; and/or areas with other activities that may contribute pollutants to the storm water.

Stoichiometric means the quantity of a reagent calculated to be necessary and sufficient for a given chemical reaction.

Storm water means storm water runoff, snow melt runoff, surface runoff and drainage, and non-storm water included under the conditions of this permit.

Storm water discharge point is the location where the point source discharge of storm water is directed to surface waters of the state or to a separate storm sewer. It includes the location of all point source discharges where storm water exits the facility, including *outfalls* which discharge directly to surface waters of the state, and *points of discharge* which discharge directly into separate storm sewer systems.

Structural controls are physical features or structures used at a facility to manage or treat storm water.

SWPPP means the Storm Water Pollution Prevention Plan prepared in accordance with this permit.

Tier I value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier I toxicity database.

Tier II value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier II toxicity database.

Total maximum daily loads (TMDLs) are required by the Clean Water Act for waterbodies that do not meet water quality standards. TMDLs represent the maximum daily load of a pollutant that a waterbody can assimilate and meet water quality standards, and an allocation of that load among point sources, nonpoint sources, and a margin of safety.

Toxicity reduction evaluation (TRE) means a site-specific study conducted in a stepwise process designed to identify the causative agents of effluent toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity.

Water Quality Standards means the Part 4 Water Quality Standards promulgated pursuant to Part 31 of the NREPA, being R 323.1041 through R 323.1117 of the Michigan Administrative Code.

Weekly monitoring frequency refers to a calendar week which begins on Sunday and ends on Saturday. When required by this permit, an analytical result, reading, value, or observation shall be reported for that period if a discharge occurs during that period. If the calendar week begins in one month and ends in the following month, the analytical result, reading, value, or observation shall be reported in the month in which monitoring was conducted.

WWSL is a wastewater stabilization lagoon.

WWSL discharge event is a discrete occurrence during which effluent is discharged to the surface water up to 10 days of a consecutive 14-day period.

3-portion composite sample is a sample consisting of three equal-volume grab samples collected at equal intervals over an 8-hour period.

PART II

Section A. Definitions

7-day concentration
FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – The 7-day concentration is the sum of the daily concentrations determined during any 7 consecutive days of discharge during a WWSL discharge event divided by the number of daily concentrations determined. If the number of daily concentrations determined during the WWSL discharge event is less than 7 days, the number of actual daily concentrations determined shall be used for the calculation. The calculated 7-day concentration will be used to determine compliance with any maximum 7-day concentration limitations. When required by the permit, report the maximum calculated 7-day concentration for the WWSL discharge event in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMR. If the WWSL discharge event was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – The 7-day concentration is the sum of the daily concentrations determined during any 7 consecutive days in a reporting month divided by the number of daily concentrations determined. If the number of daily concentrations determined is less than 7, the actual number of daily concentrations determined shall be used for the calculation. The calculated 7-day concentration will be used to determine compliance with any maximum 7-day concentration limitations in the reporting month. When required by the permit, report the maximum calculated 7-day concentration for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMR. The first 7-day calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

7-day loading
FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – The 7-day loading is the sum of the daily loadings determined during any 7 consecutive days of discharge during a WWSL discharge event divided by the number of daily loadings determined. If the number of daily loadings determined during the WWSL discharge event is less than 7 days, the number of actual daily loadings determined shall be used for the calculation. The calculated 7-day loading will be used to determine compliance with any maximum 7-day loading limitations. When required by the permit, report the maximum calculated 7-day loading for the WWSL discharge event in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMR. If the WWSL discharge event was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – The 7-day loading is the sum of the daily loadings determined during any 7 consecutive days in a reporting month divided by the number of daily loadings determined. If the number of daily loadings determined is less than 7, the actual number of daily loadings determined shall be used for the calculation. The calculated 7-day loading will be used to determine compliance with any maximum 7-day loading limitations in the reporting month. When required by the permit, report the maximum calculated 7-day loading for the month in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMR. The first 7-day calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

24-hour composite sample is a flow-proportioned composite sample consisting of hourly or more frequent portions that are taken over a 24-hour period and in which the volume of each portion is proportional to the discharge flow rate at the time that portion is taken. A time-proportioned composite sample may be used upon approval from the Department if the permittee demonstrates it is representative of the discharge.

PART II

Section B. Monitoring Procedures

1. Representative Samples

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Test Procedures

Test procedures for the analysis of pollutants shall conform to regulations promulgated pursuant to Section 304(h) of the Clean Water Act (40 CFR Part 136 – Guidelines Establishing Test Procedures for the Analysis of Pollutants), unless specified otherwise in this permit. **Test procedures used shall be sufficiently sensitive to determine compliance with applicable effluent limitations**. For lists of approved test methods, go to https://www.epa.gov/cwa-methods. Requests to use test procedures not promulgated under 40 CFR Part 136 for pollutant monitoring required by this permit shall be made in accordance with the Alternate Test Procedures regulations specified in 40 CFR 136.4. These requests shall be submitted to the Manager of the Permits Section, Water Resources Division, Michigan Department of Environment, Great Lakes, and Energy, P.O. Box 30458, Lansing, Michigan, 48909-7958. The permittee may use such procedures upon approval.

The permittee shall periodically calibrate and perform maintenance procedures on all analytical instrumentation at intervals to ensure accuracy of measurements. The calibration and maintenance shall be performed as part of the permittee's laboratory Quality Assurance/Quality Control program.

3. Instrumentation

The permittee shall periodically calibrate and perform maintenance procedures on all monitoring instrumentation at intervals to ensure accuracy of measurements.

4. Recording Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information: 1) the exact place, date, and time of measurement or sampling; 2) the person(s) who performed the measurement or sample collection; 3) the dates the analyses were performed; 4) the person(s) who performed the analyses; 5) the analytical techniques or methods used; 6) the date of and person responsible for equipment calibration; and 7) the results of all required analyses.

5. Records Retention

All records and information resulting from the monitoring activities required by this permit, including all records of analyses performed, calibration and maintenance of instrumentation, and recordings from continuous monitoring instrumentation, shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the Department.

PART II

Section C. Reporting Requirements

1. Start-Up Notification

If the permittee will not discharge during the first 60 days following the effective date of this permit, the permittee shall notify the Department within 14 days following the effective date of this permit, and then 60 days prior to the commencement of the discharge.

2. Submittal Requirements for Self-Monitoring Data

Part 31 of the NREPA (specifically Section 324.3110(7)); and R 323.2155(2) of Part 21, Wastewater Discharge Permits, promulgated under Part 31 of the NREPA, allow the Department to specify the forms to be utilized for reporting the required self-monitoring data. Unless instructed on the effluent limitations page to conduct "Retained Self-Monitoring," the permittee shall submit self-monitoring data via the Department's MiWaters system.

The permittee shall utilize the information provided on the MiWaters website, located at https://miwaters.deq.state.mi.us, to access and submit the electronic forms. Both monthly summary and daily data shall be submitted to the Department no later than the 20th day of the month following each month of the authorized discharge period(s). The permittee may be allowed to submit the electronic forms after this date if the Department has granted an extension to the submittal date.

3. Retained Self-Monitoring Requirements

If instructed on the effluent limits page (or otherwise authorized by the Department in accordance with the provisions of this permit) to conduct retained self-monitoring, the permittee shall maintain a year-to-date log of retained self-monitoring results and, upon request, provide such log for inspection to the staff of the Department. Retained self-monitoring results are public information and shall be promptly provided to the public upon request.

The permittee shall certify, in writing, to the Department, on or before January 10th (April 1st for animal feeding operation facilities) of each year, that: 1) all retained self-monitoring requirements have been complied with and a year-to-date log has been maintained; and 2) the application on which this permit is based still accurately describes the discharge. With this annual certification, the permittee shall submit a summary of the previous year's monitoring data. The summary shall include maximum values for samples to be reported as daily maximums and/or monthly maximums and minimum values for any daily minimum samples.

Retained self-monitoring may be denied to a permittee by notification in writing from the Department. In such cases, the permittee shall submit self-monitoring data in accordance with Part II.C.2., above. Such a denial may be rescinded by the Department upon written notification to the permittee. Reissuance or modification of this permit or reissuance or modification of an individual permittee's authorization to discharge shall not affect previous approval or denial for retained self-monitoring unless the Department provides notification in writing to the permittee.

4. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report. Such increased frequency shall also be indicated.

PART II

Section C. Reporting Requirements

Monitoring required pursuant to Part 41 of the NREPA or Rule 35 of the Mobile Home Park Commission Act, 1987 PA 96, as amended, for assurance of proper facility operation, shall be submitted as required by the Department.

5. Compliance Dates Notification

Within 14 days of every compliance date specified in this permit, the permittee shall submit a written notification to the Department indicating whether or not the particular requirement was accomplished. If the requirement was not accomplished, the notification shall include an explanation of the failure to accomplish the requirement, actions taken or planned by the permittee to correct the situation, and an estimate of when the requirement will be accomplished. If a written report is required to be submitted by a specified date and the permittee accomplishes this, a separate written notification is not required.

6. Noncompliance Notification

Compliance with all applicable requirements set forth in the Clean Water Act, Parts 31 and 41 of the NREPA, and related regulations and rules is required. All instances of noncompliance shall be reported as follows:

a. 24-Hour Reporting
Any noncompliance which may endanger health or the environment (including maximum and/or minimum daily concentration discharge limitation exceedances) shall be reported, verbally, within 24 hours from the time the permittee becomes aware of the noncompliance. A written submission shall also be provided within five (5) days.

b. Other Reporting
The permittee shall report, in writing, all other instances of noncompliance not described in a. above at the time monitoring reports are submitted; or, in the case of retained self-monitoring, within five (5) days from the time the permittee becomes aware of the noncompliance.

Written reporting shall include: 1) a description of the discharge and cause of noncompliance; and 2) the period of noncompliance, including exact dates and times, or, if not yet corrected, the anticipated time the noncompliance is expected to continue, and the steps taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

7. Spill Notification

The permittee shall immediately report any release of any polluting material which occurs to the surface waters or groundwaters of the state, unless the permittee has determined that the release is not in excess of the threshold reporting quantities specified in the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code), by calling the Department at the number indicated on the second page of this permit (or, if this is a general permit, on the COC); or, if the notice is provided after regular working hours, call the Department's 24-hour Pollution Emergency Alerting System telephone number, 1-800-292-4706.

Within 10 days of the release, the permittee shall submit to the Department a full written explanation as to the cause of the release, the discovery of the release, response (clean-up and/or recovery) measures taken, and preventive measures taken or a schedule for completion of measures to be taken to prevent reoccurrence of similar releases.

PART II

Section C. Reporting Requirements

8. Upset Noncompliance Notification

If a process "upset" (defined as an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee) has occurred, the permittee who wishes to establish the affirmative defense of upset shall notify the Department by telephone within 24 hours of becoming aware of such conditions; and within five (5) days, provide in writing, the following information:

a. that an upset occurred and that the permittee can identify the specific cause(s) of the upset;

b. that the permitted wastewater treatment facility was, at the time, being properly operated and maintained (note that an upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation); and

c. that the permittee has specified and taken action on all responsible steps to minimize or correct any adverse impact in the environment resulting from noncompliance with this permit.

No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

In any enforcement proceedings, the permittee, seeking to establish the occurrence of an upset, has the burden of proof.

9. Bypass Prohibition and Notification

a. Bypass Prohibition
Bypass is prohibited, and the Department may take an enforcement action, unless:

1) bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

2) there were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass; and

3) the permittee submitted notices as required under b. or c. below.

b. Notice of Anticipated Bypass
If the permittee knows in advance of the need for a bypass, the permittee shall submit written notification to the Department before the anticipated date of the bypass. This notification shall be submitted at least 10 days before the date of the bypass; however, the Department will accept fewer than 10 days advance notice if adequate explanation for this is provided. The notification shall provide information about the anticipated bypass as required by the Department. The Department may approve an anticipated bypass, after considering its adverse effects, if it will meet the three (3) conditions specified in a. above.

c. Notice of Unanticipated Bypass
As soon as possible but no later than 24 hours from the time the permittee becomes aware of the unanticipated bypass, the permittee shall notify the Department by calling the number indicated on the second page of this permit (or, if this is a general permit, on the COC); or, if notification is provided after regular working hours, call the Department's 24-hour Pollution Emergency Alerting System telephone number, 1-800-292-4706.

PART II

Section C. Reporting Requirements

d. Written Report of Bypass
A written submission shall be provided within five (5) working days of commencing any bypass to the Department, and at additional times as directed by the Department. The written submission shall contain a description of the bypass and its cause; the period of bypass, including exact dates and times, and if the bypass has not been corrected, the anticipated time it is expected to continue; steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass; and other information as required by the Department.

e. Bypass Not Exceeding Limitations
The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to ensure efficient operation. These bypasses are not subject to the provisions of 9.a., 9.b., 9.c., and 9.d., above. This provision does not relieve the permittee of any notification responsibilities under Part II.C.11. of this permit.

f. Definitions

1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

10. Bioaccumulative Chemicals of Concern (BCC)

Consistent with the requirements of R 323.1098 and R 323.1215 of the Michigan Administrative Code, the permittee is prohibited from undertaking any action that would result in a lowering of water quality from an increased loading of a BCC unless an increased use request and antidegradation demonstration have been submitted and approved by the Department.

11. Notification of Changes in Discharge

The permittee shall notify the Department, in writing, as soon as possible but no later than 10 days of knowing, or having reason to believe, that any activity or change has occurred or will occur which would result in the discharge of: 1) detectable levels of chemicals on the current Michigan Critical Materials Register, priority pollutants or hazardous substances set forth in 40 CFR 122.21, Appendix D, or the Pollutants of Initial Focus in the Great Lakes Water Quality Initiative specified in 40 CFR 132.6, Table 6, which were not acknowledged in the application or listed in the application at less than detectable levels; 2) detectable levels of any other chemical not listed in the application or listed at less than detection, for which the application specifically requested information; or 3) any chemical at levels greater than five times the average level reported in the complete application (see the first page of this permit, for the date(s) the complete application was submitted). Any other monitoring results obtained as a requirement of this permit shall be reported in accordance with the compliance schedules.

PART II

Section C. Reporting Requirements

12. Changes in Facility Operations

Any anticipated action or activity, including but not limited to facility expansion, production increases, or process modification, which will result in new or increased loadings of pollutants to the receiving waters must be reported to the Department by a) submission of an increased use request (application) and all information required under R 323.1098 (Antidegradation) of the Water Quality Standards or b) by written notice if the following conditions are met: 1) the action or activity will not result in a change in the types of wastewater discharged or result in a greater quantity of wastewater than currently authorized by this permit; 2) the action or activity will not result in violations of the effluent limitations specified in this permit; 3) the action or activity is not prohibited by the requirements of Part II.C.10.; and 4) the action or activity will not require notification pursuant to Part II.C.11. Following such written notice, the permit or, if applicable, the facility's COC, may be modified according to applicable laws and rules to specify and limit any pollutant not previously limited.

13. Transfer of Ownership or Control

In the event of any change in control or ownership of facilities from which the authorized discharge emanates, the permittee shall submit to the Department 30 days prior to the actual transfer of ownership or control a written agreement between the current permittee and the new permittee containing: 1) the legal name and address of the new owner; 2) a specific date for the effective transfer of permit responsibility, coverage and liability; and 3) a certification of the continuity of or any changes in operations, wastewater discharge, or wastewater treatment.

If the new permittee is proposing changes in operations, wastewater discharge, or wastewater treatment, the Department may propose modification of this permit in accordance with applicable laws and rules.

14. Operations and Maintenance Manual

For wastewater treatment facilities that serve the public (and are thus subject to Part 41 of the NREPA), Section 4104 of Part 41 and associated Rule 2957 of the Michigan Administrative Code allow the Department to require an Operations and Maintenance (O&M) Manual from the facility. An up-to-date copy of the O&M Manual shall be kept at the facility and shall be provided to the Department upon request. The Department may review the O&M Manual in whole or in part at its discretion and require modifications to it if portions are determined to be inadequate.

At a minimum, the O&M Manual shall include the following information: permit standards; descriptions and operation information for all equipment; staffing information; laboratory requirements; record keeping requirements; a maintenance plan for equipment; an emergency operating plan; safety program information; and copies of all pertinent forms, as-built plans, and manufacturer's manuals.

Certification of the existence and accuracy of the O&M Manual shall be submitted to the Department at least sixty days prior to start-up of a new wastewater treatment facility. Recertification shall be submitted sixty days prior to start-up of any substantial improvements or modifications made to an existing wastewater treatment facility.

PART II

Section C. Reporting Requirements

15. Signatory Requirements

All applications, reports, or information submitted to the Department in accordance with the conditions of this permit and that require a signature shall be signed and certified as described in the Clean Water Act and the NREPA.

The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance, shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

The NREPA (Section 3115(2)) provides that a person who at the time of the violation knew or should have known that he or she discharged a substance contrary to this part, or contrary to a permit, COC, or order issued or rule promulgated under this part, or who intentionally makes a false statement, representation, or certification in an application for or form pertaining to a permit or COC or in a notice or report required by the terms and conditions of an issued permit or COC, or who intentionally renders inaccurate a monitoring device or record required to be maintained by the Department, is guilty of a felony and shall be fined not less than $2,500.00 or more than $25,000.00 for each violation. The court may impose an additional fine of not more than $25,000.00 for each day during which the unlawful discharge occurred. If the conviction is for a violation committed after a first conviction of the person under this subsection, the court shall impose a fine of not less than $25,000.00 per day and not more than $50,000.00 per day of violation. Upon conviction, in addition to a fine, the court in its discretion may sentence the defendant to imprisonment for not more than 2 years or impose probation upon a person for a violation of this part. With the exception of the issuance of criminal complaints, issuance of warrants, and the holding of an arraignment, the circuit court for the county in which the violation occurred has exclusive jurisdiction. However, the person shall not be subject to the penalties of this subsection if the discharge of the effluent is in conformance with and obedient to a rule, order, permit, or COC of the Department. In addition to a fine, the attorney general may file a civil suit in a court of competent jurisdiction to recover the full value of the injuries done to the natural resources of the state and the costs of surveillance and enforcement by the state resulting from the violation.

16. Electronic Reporting

Upon notice by the Department that electronic reporting tools are available for specific reports or notifications, the permittee shall submit electronically all such reports or notifications as required by this permit, on forms provided by the Department.

PART II

Section D. Management Responsibilities

1. Duty to Comply

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit, more frequently than, or at a level in excess of, that authorized, shall constitute a violation of the permit.

It is the duty of the permittee to comply with all the terms and conditions of this permit. Any noncompliance with the Effluent Limitations, Special Conditions, or terms of this permit constitutes a violation of the NREPA and/or the Clean Water Act and constitutes grounds for enforcement action; for permit or Certificate of Coverage (COC) termination, revocation and reissuance, or modification; or denial of an application for permit or COC renewal.

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

2. Operator Certification

The permittee shall have the waste treatment facilities under direct supervision of an operator certified at the appropriate level for the facility certification by the Department, as required by Sections 3110 and 4104 of the NREPA. Permittees authorized to discharge storm water shall have the storm water treatment and/or control measures under direct supervision of a storm water operator certified by the Department, as required by Section 3110 of the NREPA.

3. Facilities Operation

The permittee shall, at all times, properly operate and maintain all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes adequate laboratory controls and appropriate quality assurance procedures.

4. Power Failures

In order to maintain compliance with the effluent limitations of this permit and prevent unauthorized discharges, the permittee shall either:

a. provide an alternative power source sufficient to operate facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit; or

b. upon the reduction, loss, or failure of one or more of the primary sources of power to facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit, the permittee shall halt, reduce or otherwise control production and/or all discharge in order to maintain compliance with the effluent limitations and conditions of this permit.

5. Adverse Impact

The permittee shall take all reasonable steps to minimize or prevent any adverse impact to the surface waters or groundwaters of the state resulting from noncompliance with any effluent limitation specified in this permit including, but not limited to, such accelerated or additional monitoring as necessary to determine the nature and impact of the discharge in noncompliance.

PART II

Section D. Management Responsibilities

6. Containment Facilities

The permittee shall provide facilities for containment of any accidental losses of polluting materials in accordance with the requirements of the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code). For a POTW, these facilities shall be approved under Part 41 of the NREPA.

7. Waste Treatment Residues

Residuals (i.e. solids, sludges, biosolids, filter backwash, scrubber water, ash, grit, or other pollutants or wastes) removed from or resulting from treatment or control of wastewaters, including those that are generated during treatment or left over after treatment or control has ceased, shall be disposed of in an environmentally compatible manner and according to applicable laws and rules. These laws may include, but are not limited to, the NREPA, Part 31 for protection of water resources, Part 55 for air pollution control, Part 111 for hazardous waste management, Part 115 for solid waste management, Part 121 for liquid industrial wastes, Part 301 for protection of inland lakes and streams, and Part 303 for wetlands protection. Such disposal shall not result in any unlawful pollution of the air, surface waters or groundwaters of the state.

8. Right of Entry

The permittee shall allow the Department, any agent appointed by the Department, or the Regional Administrator, upon the presentation of credentials and, for animal feeding operation facilities, following appropriate biosecurity protocols:

a. to enter upon the permittee's premises where an effluent source is located or any place in which records are required to be kept under the terms and conditions of this permit; and

b. at reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect process facilities, treatment works, monitoring methods and equipment regulated or required under this permit; and to sample any discharge of pollutants.

9. Availability of Reports

Except for data determined to be confidential under Section 308 of the Clean Water Act and Rule 2128 (R 323.2128 of the Michigan Administrative Code), all reports prepared in accordance with the terms of this permit, shall be available for public inspection at the offices of the Department and the Regional Administrator. As required by the Clean Water Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Clean Water Act and Sections 3112, 3115, 4106 and 4110 of the NREPA.

10. Duty to Provide Information

The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or the facility's COC, or to determine compliance with this permit. The permittee shall also furnish to the Department, upon request, copies of records required to be kept by this permit.

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.

PART II

Section E. Activities Not Authorized by This Permit

1. Discharge to the Groundwaters

This permit does not authorize any discharge to the groundwaters. Such discharge may be authorized by a groundwater discharge permit issued pursuant to the NREPA.

2. POTW Construction

This permit does not authorize or approve the construction or modification of any physical structures or facilities at a POTW. Approval for the construction or modification of any physical structures or facilities at a POTW shall be by permit issued under Part 41 of the NREPA.

3. Civil and Criminal Liability

Except as provided in permit conditions on "Bypass" (Part II.C.9. pursuant to 40 CFR 122.41(m)), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance, whether or not such noncompliance is due to factors beyond the permittee's control, such as accidents, equipment breakdowns, or labor disputes.

4. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee may be subject under Section 311 of the Clean Water Act except as are exempted by federal regulations.

5. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Clean Water Act.

6. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other Department of Environment, Great Lakes, and Energy permits, or approvals from other units of government as may be required by law.

Appendix H

CCTV Investigation Summary

City of Mount Clemens
SAW Grant Asset Management Plan Executive Summary

Overview

The City of Mt. Clemens is home to over 16,000 residents in a total area comprising 4.20 square miles, of which 4.07 square miles is land and 0.13 square miles is water. The City of Mount Clemens owns and operates a wastewater sewer collection system, including a wastewater treatment plant and retention treatment basin. The majority of the sanitary sewers in the wastewater system were constructed prior to 1950, and have received little to no maintenance since the original installation.

The City of Mt. Clemens was awarded a Stormwater, Asset Management, and Wastewater (SAW) Grant totaling $1,847,632, including a local match of $8,750.00 (total $1,856,382.00), to investigate and evaluate the City's wastewater assets. Through development and implementation of a wastewater asset management plan, the insight and understanding of the system's wastewater sewer system has significantly improved. This comprehensive investigation included an asset inventory and inspection, a condition assessment, a capital improvement plan, and development of a Graphical Information System (GIS) which includes mapping, database and system information.

Wastewater Asset Inventory

In compiling the wastewater asset management plan, an asset inventory was performed by means of examining construction plans, GPS location, and visual observation. The inventory verified that Mt. Clemens wastewater sewer line assets include over 78 miles (416,128 ft.) of enclosed sanitary sewer lines, combined sewer lines, and storm sewer lines connected to the combined sewer system. In association with the discovered sewer lines, 2,027 sanitary, combined and storm structures were discovered. Additionally, the wastewater collection system includes six pump stations, a Retention Treatment Basin (RTB), and a Wastewater Treatment Plant.

Condition Assessment

Based on funding limitations, a condition assessment was performed on 1,606 sewer segments (total length 352,923 ft.) out of 2,254 sewer segments (total length 416,128 ft.), 1,304 structures out of 2027 in total, and all of the sewer collection pump stations. The condition assessment for the sanitary sewer was performed by means of Closed Circuit Television (CCTV), while investigation of wastewater structures and pump stations were performed by means of visual assessment.

The condition assessment consists of an overall rating scale from 1 to 5. Whereby 1 indicates new or excellent condition and 5 indicates imminent failure. The below tables summarize the condition of all assets investigated.

Diameter (in)	Sewer Line Condition Assessment (feet)				
	1	2	3	4	5
3	0	0	0	0	0
4	0	0	0	0	0
6	243	0	0	0	14
8	3,165	1,729	105	92	126
10	3,651	2,061	964	612	331
12	45,838	83,531	40,648	16,062	24,394
15	5,917	10,823	11,521	4,274	5,494
16	0	0	0	0	0
18	5,415	13,537	11,969	4,574	3,741
20	0	270	798	0	0
21	0	0	0	0	0
24	4,638	4,250	8,412	1,347	1,386
27	0	0	28	0	0
30	2,657	189	3,056	268	206
33	139	0	0	0	0
36	2,974	363	1,725	0	0
42	933	0	0	0	0
48	1,128	0	0	0	0
54	1,307	468	0	0	0
72	1,128	0	0	792	0
108	987	4,054	0	0	0
114	0	0	0	0	0
3'x4'	8,031	0	557	0	0

Rating	Sanitary Manhole	Combined Manhole	Storm Manhole	Catch Basin	Total
5	13	8	0	21	42
4	153	87	2	73	315
3	346	225	0	89	660
2	147	85	2	51	285
1	2	0	0	0	2
Unknown	278	151	63	231	723
Total	939	556	67	465	2027

Pump Station #	Condition Assessment
N. Wilson	2
N. Rose	3
Gratiot	2
Breitmeyer	2
Sugarbeet	4
M-97	3

Level of Service

For the City's wastewater system, the level of service is the satisfaction of the residents, business owners and property owners. There is one key factor that can affect the perceived Level of Service of the system - Sewer Backups, which can result in both street, yard and basement flooding. Mt. Clemens' wastewater system is currently operating a satisfactory level of service and will continue to do so through the continued maintenance, rehabilitation and replacement of its assets as presented in the Capital Improvement Plan.

Criticality of Assets

Assets were then analyzed to determine their Probability of Failure (POF) and Consequence of Failure (COF). The POF takes into account the condition assessment rating, and the useful life expended. The COF takes into account financial, safety and environmental impacts. Both the POF and COF are analyzed on a 1 to 5 rating scale. The POF and COF scores are then multiplied together resulting in the criticality score or the Business Risk Exposure (BRE) score. The BRE score is used to prioritize what assets are most critically in need of repair. The MDEQ guidelines state that any asset with a BRE score of 16 or greater is considered critical.

Asset	Business Risk Exposure Score		
	Minimum	Maximum	Average
Pipes	1.88	21.88	8.9
Manholes	3.4	22	11.1

The Mt. Clemens waste water system has numerous wastewater sewers and structures and one pump station where the BRE scores exceed the MDEQ critical rating of 16. Based on the current assessments and projections, the following exceeds the BRE of 16:

81 wastewater sewer line segments

65 sanitary structures

1 pump station

Revenue Structure

The City has a two part rate structure comprised of a service charge and a consumption charge, as outlined by 1993 City Ordinance No. 25.110. The service charge is a fixed fee that is designed to recover fixed costs of operating, maintaining and repairing the system. The consumption charge or usage charge is a rate applied to the amount of water used and this charge covers the remaining cost of operation, maintenance and repair expenses not collected by the Service Charge. On September 17, 2018, the City of Mount Clemens adopted a 4% rate increase, as follows:

Fee Category	Old Rates	FY 2019 - Adopted	Quarterly Difference	Monthly Difference
Water				
Service Charge - Quarterly Fixed	$ 27.44	$ 27.44		
Commodity Charge - Per CCF	$ 3.51	$ 3.35		
Total Water Charge (18.6 CCF/Quarter Use)	**$ 92.63**	**$ 89.66**	**$ (2.97)**	**$ (0.99)**
Sewer				
Service Charge - Quarterly Fixed	$ 21.01	$ 21.01		
Commodity Charge - Per CCF	$ 4.60	$ 5.19		
Total Sewer Charge (18.6 CCF/Quarter Use)	**$ 106.44**	**$ 117.40**	**$ 10.96**	**$ 3.65**
Overall				
Total (18.6 CCF/Quarter Use)	**$ 199.07**	**$ 207.06**	**$ 7.99**	**$ 2.66**

Note: A meter size of 5/8" and water usage of 18.6 CCF/Quarter were used in determining the above quarterly bill amounts.

The current rate structure supports the current needs of the below, presented capital improvement plan. Projects identified in the capital improvement plan will be annually incorporated into the budget for approval by the City Commission.

Capital Improvement Plan

The 20-Year Capital Improvement Plan (CIP) is shown in the below table. This plan will be updated every year when the budget is completed.

20-Year Capital Improvement Plan

Fiscal Year	Projects	Project Cost[1]	Total Project Costs
2019-20	Influent Sampler	$ 10,000	$ 89,000
	Tertiary Effluent Sampler	$ 10,000	
	RTB Joint Repairs	$ 30,000	
	Ferric Chloride Pump	$ 5,000	
	Catonic Polymer Pump 1 & 2	$ 13,000	
	UV Disinfection System Lights	$ 21,000	
2020-21	Influent Isolation Valves (E & W)	$ 50,000	$ 1,216,000
	Ferric Chloride Pump	$ 5,000	
	Raw Sewage Valves & Piping	$ 15,000	
	Centrifuge Feed Pump 1 & 2	$ 60,000	
	VFDs for Centrifuge Feed Pump 1 & 2	$ 30,000	
	2 Oxidation Ditch Rotor & Motor	$ 120,000	
	Sand Filter Payback	$ 550,000	
	UV Disinfection System Lights	$ 21,000	
	Sludge Transfer Pump 2	$ 30,000	
	Groundwater Pump Station Repairs	$ 35,000	
	Dewatering Vault Repairs	$ 300,000	
2021-22	2 Oxidation Ditch Rotor & Motor	$ 120,000	$ 1,246,000
	Sand Filter Payback	$ 550,000	
	John Deere Skid-Steer Loader	$ 25,000	
	Collection Pipe & MH Repairs	$ 500,000	
	VFDs for Raw Sewage Pump 1 & 2	$ 30,000	
	UV Disinfection System Lights	$ 21,000	

Continued: 20-Year Capital Improvement Plan

Fiscal Year	Projects	Project Cost[1]	Total Project Costs
2022-23	2 Oxidation Ditch Rotor & Motor	$ 120,000	$ 1,291,000
	Sand Filter Payback	$ 550,000	
	UV Disinfection System Lights	$ 21,000	
	Collection Pipe & MH Repairs	$ 500,000	
	Basin Bleach Pumps & Piping	$ 60,000	
	Centrifuge	$ 25,000	
	Scum Ejector 1	$ 10,000	
	Automatic Scum Strainer	$ 5,000	
2023-24	2 Oxidation Ditch Rotor & Motor	$ 120,000	$ 1,288,000
	Sand Filter Payback	$ 550,000	
	Clark HiLo	$ 30,000	
	Collection Pipe & MH Repairs	$ 500,000	
	Sludge Aeration Blower	$ 12,000	
	Ditch Sludge Valves & Piping	$ 50,000	
	UV Disinfection System Lights	$ 21,000	
	PEW Pump 1	$ 5,000	
2024-25	2 Oxidation Ditch Rotor & Motor	$ 120,000	$ 1,441,000
	UV Disinfection System Lights	$ 21,000	
	Oxidation Ditch Joint Repairs	$ 50,000	
	CCTV of Collection System	$ 1,200,000	
	Grit Chamber & Washer 1 & 2	$ 50,000	
2025-26	UV Disinfection System Lights	$ 21,000	$ 1,253,000
	MACP Inspection of Manholes	$ 175,000	
	John Deere Gator	$ 7,000	
	Vactor Dumping Station Upgrades	$ 150,000	
	Site Pavement Upgrades	$ 200,000	
	Collection Pipe & MH Repairs	$ 500,000	
	HVAC - Entire Facility	$ 200,000	
2026-27	UV Disinfection System Lights	$ 21,000	$ 1,271,000
	Groesbeck PS Upgrades	$ 350,000	
	N Rose PS Upgrades	$ 350,000	
	RTB Aerator Blowers (3 Total)	$ 50,000	
	Collection Pipe & MH Repairs	$ 500,000	

Continued: 20-Year Capital Improvement Plan

Fiscal Year	Projects	Project Cost[1]	Total Project Costs
2027-28	UV Disinfection System Lights	$ 21,000	$ 1,136,000
	Breitmeyer PS Upgrades	$ 200,000	
	Sugarbeet PS Upgrades	$ 100,000	
	N Wilson PS Upgrades	$ 50,000	
	Replace Doors All Buildings	$ 150,000	
	Replace Roofs All Buildings	$ 75,000	
	Power Washer	$ 5,000	
	Centrifuge	$ 25,000	
	Collection Pipe & MH Repairs	$ 500,000	
	Chariot Lawn Mower w/ trailer	$ 10,000	
2028-29	Sludge Aeration Blower	$ 12,000	$ 1,393,000
	UV Disinfection System Lights	$ 21,000	
	Paint All Buildings	$ 100,000	
	Replace Windows All Buildings	$ 150,000	
	SCADA Upgrades	$ 100,000	
	Collection Pipe & MH Repairs	$ 500,000	
	Automatic Wet Well Bar Screen	$ 500,000	
	R.A.S. Pump Speed Control No. 2	$ 10,000	
2029-30	UV Disinfection System Lights	$ 21,000	$ 1,021,000
	Secondary Clarifiers 1 & 2	$ 1,000,000	
2030-31	UV Disinfection System Lights	$ 21,000	$ 1,521,000
	WWTP & RTB Electrical Upgrades	$ 1,000,000	
	Collection Pipe & MH Repairs	$ 500,000	
2031-32	UV Disinfection System Lights	$ 21,000	$ 1,221,000
	CCTV of Collection System	$ 1,200,000	
2032-33	UV Disinfection System Lights	$ 21,000	$ 1,221,000
	MACP Inspection of Manholes	$ 175,000	
	Centrifuge	$ 25,000	
	Collection Pipe & MH Repairs	$ 1,000,000	
2033-34	Sludge Aeration Blower	$ 12,000	$ 1,333,000
	RTB Centrifugal Pump Major Overhaul (1 of 5)	$ 300,000	
	UV Disinfection System Lights	$ 21,000	
	Collection Pipe & MH Repairs	$ 1,000,000	

Continued: 20-Year Capital Improvement Plan

Fiscal Year	Projects	Project Cost[1]	Total Project Costs
2034-35	UV Disinfection System Lights	$ 21,000	$ 1,321,000
	RTB Centrifugal Pump Major Overhaul (2 of 5)	$ 300,000	
	Collection Pipe & MH Repairs	$ 1,000,000	
2035-36	UV Disinfection System Lights	$ 21,000	$ 1,321,000
	RTB Centrifugal Pump Major Overhaul (3 of 5)	$ 300,000	
	Collection Pipe & MH Repairs	$ 1,000,000	
2036-37	UV Disinfection System Lights	$ 21,000	$ 1,321,000
	RTB Centrifugal Pump Major Overhaul (4 of 5)	$ 300,000	
	Collection Pipe & MH Repairs	$ 1,000,000	
2037-38	UV Disinfection System Lights	$ 21,000	$ 1,346,000
	RTB Centrifugal Pump Major Overhaul (5 of 5)	$ 300,000	
	Centrifuge	$ 25,000	
	Collection Pipe & MH Repairs	$ 1,000,000	
2038-39	UV Disinfection System Lights	$ 21,000	$ 1,321,000
	SCADA Upgrades	$ 100,000	
	CCTV of Collection System	$ 1,200,000	

Note: [1]Project Cost is shown in 2018 costs. It is assumed that future rate increases will offset inflation.

20 Year Capital Improvement Costs vs. Anticipated Budget

Fiscal Year	Anticipated Capital Budget[1]	Planned Project Costs	Difference	Cash On Hand[2]
2019-20	$ 118,659	$ 89,000	$ 29,659	$ 1,029,659
2020-21	$ 1,288,940	$ 1,216,000	$ 72,940	$ 1,102,599
2021-22	$ 1,290,440	$ 1,246,000	$ 44,440	$ 1,147,039
2022-23	$ 1,287,003	$ 1,291,000	$ (3,997)	$ 1,143,042
2023-24	$ 1,288,628	$ 1,288,000	$ 628	$ 1,143,670
2024-25	$ 1,290,253	$ 1,441,000	$ (150,747)	$ 992,923
2025-26	$ 1,286,940	$ 1,253,000	$ 33,940	$ 1,026,863
2026-27	$ 1,288,690	$ 1,271,000	$ 17,690	$ 1,044,553
2027-28	$ 1,290,440	$ 1,136,000	$ 154,440	$ 1,198,993
2028-29	$ 1,287,253	$ 1,393,000	$ (105,747)	$ 1,093,246
2029-30	$ 1,289,128	$ 1,021,000	$ 268,128	$ 1,361,374
2030-31	$ 1,290,422	$ 1,521,000	$ (230,578)	$ 1,130,796
2031-32	$ 1,365,778	$ 1,221,000	$ 144,778	$ 1,275,574
2032-33	$ 1,365,778	$ 1,221,000	$ 144,778	$ 1,420,352
2033-34	$ 1,365,778	$ 1,333,000	$ 32,778	$ 1,453,130
2034-35	$ 1,365,778	$ 1,321,000	$ 44,778	$ 1,497,908
2035-36	$ 1,365,778	$ 1,321,000	$ 44,778	$ 1,542,686
2036-37	$ 1,365,778	$ 1,321,000	$ 44,778	$ 1,587,464
2037-38	$ 1,365,778	$ 1,346,000	$ 19,778	$ 1,607,242
2038-39	$ 1,365,778	$ 1,321,000	$ 44,778	$ 1,652,020
Total	**$ 25,223,020**	**$ 24,571,000**	**$ 652,020**	**$ 1,652,020**

Notes: [1] Anticipated Capital Budget is tabulated from the existing rate structure, effective October 1, 2018.

[2] In 2016, Cash on Hand was reported to be approximately $1,000,000.

This summary provides a brief overview of the evaluation, investigation, and offers initial insight into the Mt. Clemens Wastewater Sewer System, its assets, condition, operation, needs and the cost to maintain a good working condition for the entire wastewater system. A more comprehensive discussion can be found in the Wastewater Asset Management Plan which can be obtained by contacting Lisa Borgacz, Interim City Manager at (586)469-6818 or lborgacz@cityofmountclemens.com.

List of Major Assets

- 416,128 feet of 3-114 inch sewer collection pipe
- 2,027 sanitary, combined and storm structures
- 6 collection pump stations
- Wastewater Treatment Plant
    - Oxidation Ditch
    - Final Clarifiers
    - Preliminary Treatment and Tertiary Filter Building
    - Blower Building
    - Control Building
    - Sludge Digester Building
    - Primary and Secondary Digesters
    - Sludge Handling Building
    - Sludge Storage Tanks
    - Maintenance Building
    - Pole Barn
    - Generator Building
- Retention Treatment Basin
    - Dewatering Pump Station
    - Groundwater Pump Station
    - Chlorination Basin
    - Sedimentation Resuspension Chambers
    - Main Pumping Building
    - Generator Building

Appendix I

Critical Priority Repairs

Appendix J

Preliminary Construction Cost Estimates

Appendix K

Present Worth Analysis of Selected Alternatives

PRESENT WORTH ANALYSIS

No.	Item	Combined Sewer Separation	Sanitary Pump Station Upgrades	CWSRF Project Total
1	Capital Cost	$ 2,520,000.00	$ 3,700,000.00	$ 6,220,000.00
2	Salvage Value at 20 years	$ 1,512,000.00	$ 2,220,000.00	$ 3,732,000.00
3	Present Worth of Salvage	$ 626,875.20	$ 920,412.00	$ 1,547,287.20
4	Interest During Construction	$ 88,200.00	$ 129,500.00	$ 217,700.00
5	Annual O&M Costs	$ -	$ -	$ -
6	Present Worth of O&M	$ -	$ -	$ -
7	Total Present Worth	$ 1,981,324.80	$ 2,909,088.00	$ 4,890,412.80
8	Equivalent Annual Cost	$ 187,017.25	$ 274,588.82	$ 461,606.06

Notes:

(1) From The Preliminary Cost Estimate.

(2) Salvage Value at the end of the 20 year planning period is computed on the basis of straight line depreciation.

(3) Present Worth of Salvage Value = 0.4146 x SalvageValue at the end of 20 years

(P/F, Discount Rate=7.0%, 20 years) = 0.4146

(4) Interest During Construction = 0.5 x P x I x C

P = Construction Period in Years = 1 year

I = Discount Rate = 7.0%

C = Total Capital Cost

(5) Total Present Worth = Total Capital Cost + Present Worth of O&M + Interest During Construction - Present Worth of Salvage

(6) Equivalent Annual Cost = 0.09439 x Total Present Worth

(A/P, Discount Rate = 7.0%, 20 years) = 0.09439

Appendix L

Public Meeting Advertisement and Summary

NOTICE OF PROJECT PLANNING PUBLIC MEETING

Clean Water State Revolving Fund (CWSRF) Loan Program

Combined Sewer Separation and North Rose Sanitary Pump Station Replacement

The City of Mount Clemens will hold a public meeting on the proposed Clean Water State Revolving Fund (CWSRF) loan application to complete a Combined Sewer Separation project and Sanitary Pump Station Upgrades for the purpose of receiving comments from interested persons.

The meeting will be held at 5:00 p.m. on Monday, April 20, 2026, in the City Commission chambers, located at Mount Clemens City Hall, 1 Crocker Boulevard, Mount Clemens, Michigan 48043.

The purpose of this proposed project is to improve the reliability and performance of the City's wastewater and stormwater infrastructure. The project will separate combined sewers within targeted residential areas to reduce the risk of sewer backups and overflows. These areas include sections near Church Street, Kendrick Street, and Lois Lane. Also, the replacement of the North Rose Sanitary Pump Station will support long-term system reliability. These improvements will enhance public hearth protection, reduce wet-weather impacts, and improve environmental quality.

Project construction will involve installation of new storm sewer infrastructure to separate stormwater from existing combined sewer system, conversion of existing combined sewers to sanitary-only use, and associated pavement repairs. Construction will also include replacement of the North Rose Sanitary Pump Station, including new pumping equipment and related appurtenances. All work will primarily be conducted within public rights-of-way or City-owned property.

Impacts of the proposed project include traffic disruptions, temporary road closures, some noise, and temporary limited access to properties within the project area. These impacts are expected to be temporary and will be minimized through construction staging, traffic control, and restoration requirements. Long-term benefits include reduced basement backups, improved system capacity during wet-weather events, enhanced environmental protection, and increased reliability of the wastewater collection system.

The total estimated project cost is approximately $6 million, which is proposed to be financed through the Clean Water State Revolving Fund (CWSRF) loan program.

Copies of the plan detailing the proposed project are available for inspection on the City's website at https://mountclemens.gov/utilities/. Please follow the link on the Utilities landing page titled 'Mount Clemens CWSRF Draft Project Plan". The plan will be available beginning on Thursday, April 2, 2026.

Written comments received before the public meeting concludes on Monday, April 20, 2026, will receive a written response in the final project plan. Written comments should be sent to the City's consulting engineer preparing the final project plan. Direct written comments to Anderson, Eckstein and Westrick, ATTN: Jacob Fenech, Graduate Engineer, 51301 Schoenherr Road, Shelby Township, Michigan 48315, or by email at jfenech@aewinc.com.

Appendix M

City Council Resolution to Adopt Project Planning Document

Appendix N

Useful Life

What Is the Life Expectancy of Concrete Sewer Pipe?

Posted on April 29, 2022

What is the life expectancy of concrete sewer pipes? People usually ask this question only when the sewers malfunction, but it's a question that people should ask because utilities like sewer pipes are an unseen yet essential part of any metropolis or town. After all, it keeps things safe, clean and functioning.

Of all the materials used to make sewer pipes, concrete is the go-to choice for contractors. This is because it's resistant to rot, readily available, and can be made from eco-friendly materials.

In addition to its life expectancy? But how does concrete sewer pipe life expectancy compare to the life expectancy of a clay sewer pipe? To a steel sewer pipe? To a plastic sewer pipe?

What is a concrete sewer pipe, and why is it used?

Concrete sewer pipes come in diameters ranging from 12'' to 144''. It also comes in different shapes like standard, elliptical, and arch, depending on where they'll use it.

Builders and engineers typically choose to use RCPs over other types of pipes because of the following reasons:

- They can handle a gigantic volume of liquid in terms of volume
- It is durable and can withstand many environmental stressors
- Can operate efficiently under high-pressure conditions
- Have a long service life compared to other pipes made of different materials
- Resistant to the incursion of soil or roots
- Has high joint performance

What is the concrete sewer pipe life expectancy?

The estimated material service life (EMSL), as well as the functionality of RCP (or any buried sewer pipe), is affected by the following factors:

- Sulfate, Chloride, or acid corrosion
- Fire resistance
- pH level
- Electrochemical corrosion of steel
- Ability to resist abrasion
- Ability to resist soil and water

But sewer pipes can also be made from clay, cast iron, and plastic pipes. How does the life expectancy of these materials compare to concrete pipes?

- Clay sewer pipe life expectancy (vitrified clay pipes): A few centuries
- Cast iron pipe life expectancy: 50 to 75 years
- Plastic pipe life expectancy (Polyvinyl Chloride Pvc Pipes): 50 to 70 years
- Carbon steel pipe life expectancy: 40 to 70 years
- ABS pipe lifespan: 50 to 70 years

Where can you find concrete sewer pipes?

In addition to finding concrete sewer pipes in sewer systems, RCPs are also used in storm drains, irrigation systems, and culverts.

Want more information on concrete pipes and products?

Do you want to know more about the life expectancy of concrete sewer pipes? AmeriTex's friendly team is ready to answer your questions about pipe specifications, life expectancy, applications benefits, and more. Contact AmeriTex today.

SERVICE LIFE

HDPE CORRUGATED PIPE

The design service life of corrugated high-density polyethylene (HDPE) drainage pipe has been a subject of considerable research over the past several years. While significant long-term performance data is available for smooth-walled polyethylene pipe, the data for corrugated drainage pipes has been somewhat limited until now. The long-term results of 100 years of service life are based on some of the current widely-accepted methods employed by the plastic pipe industry, while modifying them somewhat to take into account the unique geometry and installation conditions of buried corrugated pipe.

Predicting Service Life

The process for long-term service life prediction involves two assessments:

1. The anticipated service conditions of the drainage pipe, including such factors as environmental conditions, soil and traffic loads, and the resulting long-term stresses and strains evident in the pipe, and
2. The capacity of the material and the manufactured pipe product.

The service conditions of the pipe will vary by geographic location, based on temperature and soil and traffic loads. Deep installations may result in large compressive stresses on the pipe, while shallow installations are more subject to bending and tensile stresses. These bending and tensile stress levels are typically lower in magnitude than the compressive stresses associated with deep burial conditions, but they are considered a limiting condition as the material is more prone to failure in tension rather than compression.

The capacity of the material to resist failure is the second factor that must be addressed. Based on its wide use as a piping material (i.e. gas, water, industrial, oil field, etc.) polyethylene is a highly scrutinized material and its mechanisms of failure are well known. For corrugated drainage pipe, the primary mechanisms of material failure are slow crack growth and oxidation or chemical failure.

100 Years of Service Life

Taking into account the service loads on the pipe and capacity of the HDPE material given its known mechanisms of failure, the latest research suggests the service life of corrugated HDPE pipe is well in

excess of 100 years, even at deflections greater than 5%.

For more information

See the published papers listed below which are from independent studies presented at Plastics Pipes XIII in Washington, DC, as well as the Pluimer paper published at the ASCE Pipelines Conference in Chicago.

- Evaluate The Long-Term Stress Crack Resistance of Corrugated HDPE Pipes
  Y. Grace Hsuan, J-Y Zhang and W-K Wong
  Department of Civil, Architectural and Environmental Engineering
  Drexel University, Philadelphia, USA
- Establishing 100-Year Service Life for HDPE Drainage Pipe
  Michael Pluimer
  Technical and Engineering Manager, Plastics Pipe Institute
  105 Decker Court, Suite 825
  Irving, TX 75062
- New Test Method to Determine Effect of Recycled Materials on Corrugated HDPE Pipe Performance as Projected by the Rate Process Method
  Dr. Gene Palermo
  Palermo Plastics Pipe Consulting - Friendsville, TN
  Patrick Vibien, Dr. Ken Oliphant, Tony Kosari
  Jana Laboratories - Aurora, Ontario, CANADA
- TR-43 Design Service Life of Corrugated High Density Polyethylene (HDPE) Pipe
- Statement U - Position Statement on Use of PCR in Plastic Pipe

105 Decker Court, Suite 825
Irving, Texas 75062

Uncategorized

What is the Life Expectancy of a Lift Station?

Iftikhar Anjum(https://accurateplumbingtx.com/author/iftikhar-anjum/)
September 13, 2024(https://accurateplumbingtx.com/2024/09/13/) 16 min read

Lift stations are an essential component in wastewater management, ensuring the smooth transportation of sewage from lower to higher elevations. Whether you're dealing with residential, commercial, industrial, or municipal wastewater, maintaining the efficiency and longevity of your lift station is crucial. So, what exactly is the life expectancy of a lift station, and what factors influence it? In this comprehensive guide, we'll delve into the lifespan of lift stations and the factors that affect their longevity.

What is a Lift Station?

Before diving into the factors that impact its lifespan, let's start with the basics. A **lift station** is a key facility in **wastewater treatment plants**, tasked with moving sewage from lower ground to higher ground, enabling its flow through **sanitary sewer systems**. These stations are equipped with **submersible pumps**, **non-clog pumps**, **check valves**, and other components to help transport sewage efficiently.

How Long Does a Lift Station Last?

The life expectancy of a lift station can vary significantly depending on several factors. On average, a well-maintained lift station can last between **15 to 25 years**. However, this range can change based on the lift station's design, maintenance, and operating conditions.

Factors Influencing the Life Expectancy of a Lift Station

1. Quality of Components

The **submersible pumps**, **check valves**, and other parts like **backflow prevention devices** play a critical role in the overall lifespan of the lift station. High-quality materials can resist wear and tear and environmental factors better, resulting in longer operational life. Stations built with durable **non-clog pumps** tend to last longer in environments with large debris or challenging sewage compositions.

2. Maintenance Routine

Regular **lift station service** can significantly extend the system's lifespan. Periodic **sewer cleaning** and **sewer inspections** help in identifying early signs of wear and tear, which can be rectified before turning into major issues. If a lift station is neglected, even minor failures in components like **flow meters** or **SCADA systems** (Supervisory Control and Data Acquisition) can lead to expensive repairs or total system failure.

Internal Link: Learn more about our comprehensive lift station services here (https://accurateplumbingtx.com/lift-station-service/).

3. Environmental Conditions

Wastewater treatment plants and **sewage lift stations** are subject to varying environmental factors, including stormwater influx, flooding, and extreme weather conditions. These external pressures can accelerate the wear and tear on a lift station, leading to a shorter life expectancy. Moreover, stations that manage **stormwater management** tasks may encounter more frequent operation and increased stress on pumps, leading to faster degradation.

4. Usage Intensity

The type of wastewater (e.g., **residential wastewater**, **commercial wastewater**, or **industrial wastewater**) being processed can impact the equipment's lifespan. Stations that handle higher volumes of **municipal wastewater** or manage highly polluted water can experience quicker degradation. Properly sized equipment and robust **wastewater collection systems** are critical in high-usage scenarios.

5. Technological Integration

Advanced **wastewater treatment technology** plays a pivotal role in prolonging the life of lift stations. Integrated **SCADA systems** and **telemetry** can monitor real-time performance and send alerts when maintenance is needed. Proactive maintenance, facilitated by technology, can prevent costly repairs and extend the life expectancy of the station.

Common Issues That Affect Lift Station Longevity

1. Pump Failures

One of the most frequent causes of lift station failure is the breakdown of **submersible pumps** or **non-clog pumps**. Regular checks on **check valves** and **backflow prevention devices** can ensure these pumps operate efficiently for longer periods.

2. Corrosion

Corrosion in **wet wells** or **dry wells** can reduce the life expectancy of a lift station significantly. Modern materials, such as stainless steel or corrosion-resistant coatings, can help reduce this risk.

3. Electrical Failures

Electrical systems like **SCADA systems** are prone to faults if not properly maintained. Electrical malfunctions can lead to system shutdowns, putting the entire station at risk.

How to Extend the Life Expectancy of a Lift Station

1. Regular Inspections and Maintenance

Routine **lift station service** is critical in preventing unexpected breakdowns. Regular inspection of **sewer systems**, **pumps**, and **flow meters** can catch issues before they become severe. **Sewer cleaning** and **sewer inspection** are preventive measures that help maintain the health of the lift station.

2. Upgrading to Advanced Technologies

Upgrading older lift stations with **telemetry**, **SCADA systems**, or more efficient pumps can boost their lifespan. Technology not only provides better control but also facilitates **wastewater odor control**, which helps in maintaining a cleaner environment around the station.

3. Emergency Preparedness

Natural disasters, such as floods or storms, can wreak havoc on lift stations. Implementing **stormwater management** strategies and keeping backup systems ready, such as portable pumps, can help mitigate these risks and extend the system's lifespan.

Signs That a Lift Station Needs Replacement

1. Frequent Breakdowns

If the lift station is constantly needing repairs, it may be time to consider a replacement. Components like **submersible pumps**, **backflow prevention devices**, or **check valves** that continually fail can indicate that the station has reached the end of its life.

2. Decreased Efficiency

As lift stations age, their efficiency in pumping sewage can decrease. A reduction in pumping capacity, even after regular maintenance, could signal that the station is nearing the end of its useful life.

3. High Operational Costs

If you notice a significant rise in energy bills or maintenance costs, it could be more cost-effective to replace the lift station rather than continue repairs.

How to Choose the Right Time for Replacement

Replacing a lift station too soon can be costly, but waiting too long can result in catastrophic failures. It's essential to weigh the cost of continual repairs against the cost of replacing the system. Conducting a cost-benefit analysis can help determine the right time for replacement.

Conclusion

The lifespan of a **lift station** can vary depending on factors such as maintenance, environmental conditions, and usage. Regular **lift station service**, inspections, and timely repairs are crucial in extending the life of a lift station. By leveraging advanced technologies and upgrading components as needed, you can prolong the station's operational life and avoid costly breakdowns.

Internal Link: Need lift station maintenance? Contact us here (https://accurateplumbingtx.com/contact/) for expert services.

FAQs

1. How often should a lift station be inspected?

Lift stations should be inspected at least twice a year to ensure optimal operation. For high-usage stations, quarterly inspections may be more appropriate.

2. What is the cost of maintaining a lift station?

The cost varies depending on the size and complexity of the station, but routine maintenance typically ranges from $1,000 to $5,000 annually.

3. What are common signs of a failing lift station?

Frequent pump failures, higher energy costs, and decreased efficiency in sewage transportation are common indicators that a lift station is failing.

4. Can a lift station be upgraded instead of replaced?

Yes, components like pumps, control systems, and monitoring devices can often be upgraded to extend the station's lifespan.

5. How does technology impact lift station maintenance?

Advanced technologies such as **SCADA systems** and **telemetry** improve monitoring and can predict when maintenance is required, reducing downtime and increasing lifespan.

For more information on **lift station services**, visit Accurate Plumbing Services (https://accurateplumbingtx.com/).

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