

Clark Township Wastewater Improvements

Michigan Clean Water State Revolving Fund Project Plan
Volume 1 – Report Body (**DRAFT**)

20-0149

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1211 Ludington Street
Escanaba, MI 49829

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LIST OF ABBREVIATIONS

Abbreviation	Description	Abbreviation	Description
AC	Acre	O&M	Operation and Maintenance
AMP	Asset Management Plan	OMB	US Office Of Management And Budget
ASCE	American Society of Civil Engineers	PAC	Powdered Activated Carbon
AWWA	American Waterworks Association	PACL	Polyaluminum hydroxychloride
BOD	Biological Oxygen Demand	PFAS	Per- and polyfluoroalkyl substances
BRF	Business Risk Factor	POF	Probability of Failure
CAS or CI	Cast Iron Pipe	POSA	Plan of Study Area
CFM	Cubic Feet per Minute	POTW	Publically Owned Treatment Works
CFS	Cubic Feet Per Second	PPB	Parts per Billion
CI	Chlorine	PPD	Pounds Per Day
CIP	Capital Improvement Plan	PPM	Parts Per Million
CT	Contact Time	PRV	Pressure Reducing Valve
CUPPAD	Central U.P. Planning and Devel. Reg. Commission	PS	Pump Station
DBP	Disinfection Byproduct	PSI	Pounds Per Square Inch
DI or DIP	Ductile Iron Pipe	PVC	Polyvinyl Chloride (Pipe)
DO	Dissolved Oxygen	RRI	Repair, Replacement, and Improvements (Fund)
DWAM	Drinking Water Asset Management	RUS	Rural Utility Service (USDA RD)
DWSRF	Michigan Drinking Water State Revolving Fund	SAN	Sanitary Sewer
EDU	Equivalent Dwelling Unit	SAW	Michigan Stormwater, Asset Management, And Wastewater funding
EGLE	Mich. Dept. of Environment, Great Lakes, & Energy	SCADA	Supervisory Control And Data Acquisition
ENR	Engineering News-Record	SCFM	Standard Cubic Feet per Minute
EPA	US Environmental Protection Agency	SF	Square Foot
EPDM	Ethylene Propylene Diene Terpolymer	TSS	Total Suspended Solids
EUPPDR	Eastern U.P. Planning and Devel. Reg. Commission	STO	Storm Sewer
FPS	Feet per Second	SRF	Michigan State Revolving Loan Fund
FSP	Fiscal Sustainability Plan	SWD	Side Wall Depth
GAC	Granular Activated Carbon	TDH	Total Dynamic Head
GPCD	Gallons Per Capita Per Day	TRS	Trihalomethane Removal System
GPD	Gallons Per Day	TTHM	Total Trihalomethane
GPD/IN-MI	Gallons Per Day Per Inch Diameter Mile	TWST	Treated Water Storage Tanks
GPM	Gallons Per Minute	USACE	US Army Corps Of Engineers
HP	Horsepower	USDA RD	US Dept. Of Agriculture - Rural Development
HVAC	Heating, Ventilation, and Air Conditioning (System)	UV	Ultra Violet
ITA	Intent to Apply	VFD	Variable Frequency Drive
MDNR	Michigan Department of Natural Resources	WERF	Water Environment Research Foundation

Abbreviation	Description	Abbreviation	Description
MG	Million Gallons	WM	Watermain
MGD	Million Gallons Per Day	WPA	Works Progress Administration (early public works construction program)
MG/L	Milligrams Per Liter	WRC	Michigan Water Resources Commission
MH	Access Manhole	WS	Water Service
ML	Milliliter	WTP	Water Treatment Plant
MPN	Most Probable Number	WUPPDR	Western U.P. Planning and Devel. Reg. Commission
NEMA	National Electrical Manufacturers Association	WV	Water Valve
NEPA	National Environmental Policy Act	WWTF	Wastewater Treatment Facility
NH ₃ -N	Ammonia Nitrogen	WWTP	Wastewater Treatment Plant
NPDES	National Pollutant Discharge Elimination System		
NPV	Net Present Value		
NRWA	National Rural Water Association		

SUMMARY

Project Background

This study (Project Plan) was authorized by Clark Township via execution of a letter proposal. The purpose of the Project Plan is to evaluate needs and recommend alternatives for improvements to the Township's wastewater system.

Summary of Project Need

The ultimate goal of wastewater treatment is to protect the quality of the waters of the State and protect the health of the public. Reliable operation of the wastewater collection system within the Township's utility system directly impacts the health and safety of the Township's citizens and visitors. Deficient sewers can contaminate ground and surface waters, and contribute to the wastewater treatment plant's ability to adequately treat wastewater.

Analysis of Alternatives

The principal alternatives being considered are as noted below:

Alternative 1: No Action

No implementation of a corrective measures project at this time while attempting to correct deficiencies in the system over time as maintenance budgets will allow. No Action will result in continued sewer main backups/SSOs in the system.

Alternative 2: Replacement of Grinder Pumps

Replacement and upgrading where required of 650 EOne Grinder Pumps with upgrades to controls using Township records and personnel knowledge. Of the 650 pump replacements, 50 of them will require complete tank replacement. There are an addition 50 pumps that have been replaced in the recent years that will only require upgrades to the controls. Project will address sewer main backups/SSOs in project location.

Selected Alternative

Alternative 2 to replace the grinder pumps, upgrades to controls, and replacement of tanks is the selected alternative because it provides the most cost effective option to provide improvements to structural deficiencies within the system.

Environmental Evaluation

The anticipated environmental impacts resulting from implementation of the selected alternative are relatively minor. There is no increase in the extent of the wastewater system, and no major changes in terms of residuals or other material effects. Full detail may be found under the section labeled “Environmental Evaluation”.

Mitigation Measures

Where adverse impacts due to installation of the recommended improvements cannot be avoided, mitigation measures will be implemented. Costs for mitigation measures were considered and included where applicable in project opinions of probable cost and included in construction contract documents. A full discussion of mitigation measures can be found in detail in section “Mitigation Measures”.

Public Participation

A public hearing for this CWSRF Project Plan took place on May 18, 2022. Copies of public hearing advertising and minutes are included in Appendix E of the adopted final version of this Project Plan.

PROJECT BACKGROUND

This study (Project Plan) was authorized by Clark Township via execution of a letter proposal. The purpose of the Project Plan is to evaluate needs and recommend alternatives for improvements on the Township's wastewater system.

Delineation of Study Area

Clark Township lies at the eastern tip of Mackinac County near the eastern end of Michigan's Upper Peninsula. The Township is located approximately 15 miles east-northeast from the City of St. Ignace and Straits of Mackinac. Highways M-129 (N-S) and M-134 (E-W) bisect the Township.

Figures 1 and 2 on the following pages present location and area topographic maps for the wastewater service area under consideration in this report.

Clark Township is bordered on the west and northwest by Mackinac County's Marquette Township. It is bordered by Chippewa County's Pickford Township to the northeast and Raber Township to the east. Lake Huron lies to the south.

The majority of the "mainland" portion of the Township occupies Sections 1-36, T42N R1W and Sections 1-36, T42N R1E. Parts of Les Cheneaux Islands also within Clark Township lie in Sections 1-28, T41N R1W; Sections 1-19, T41N R1E and Sections 1-10, T41N R2E.

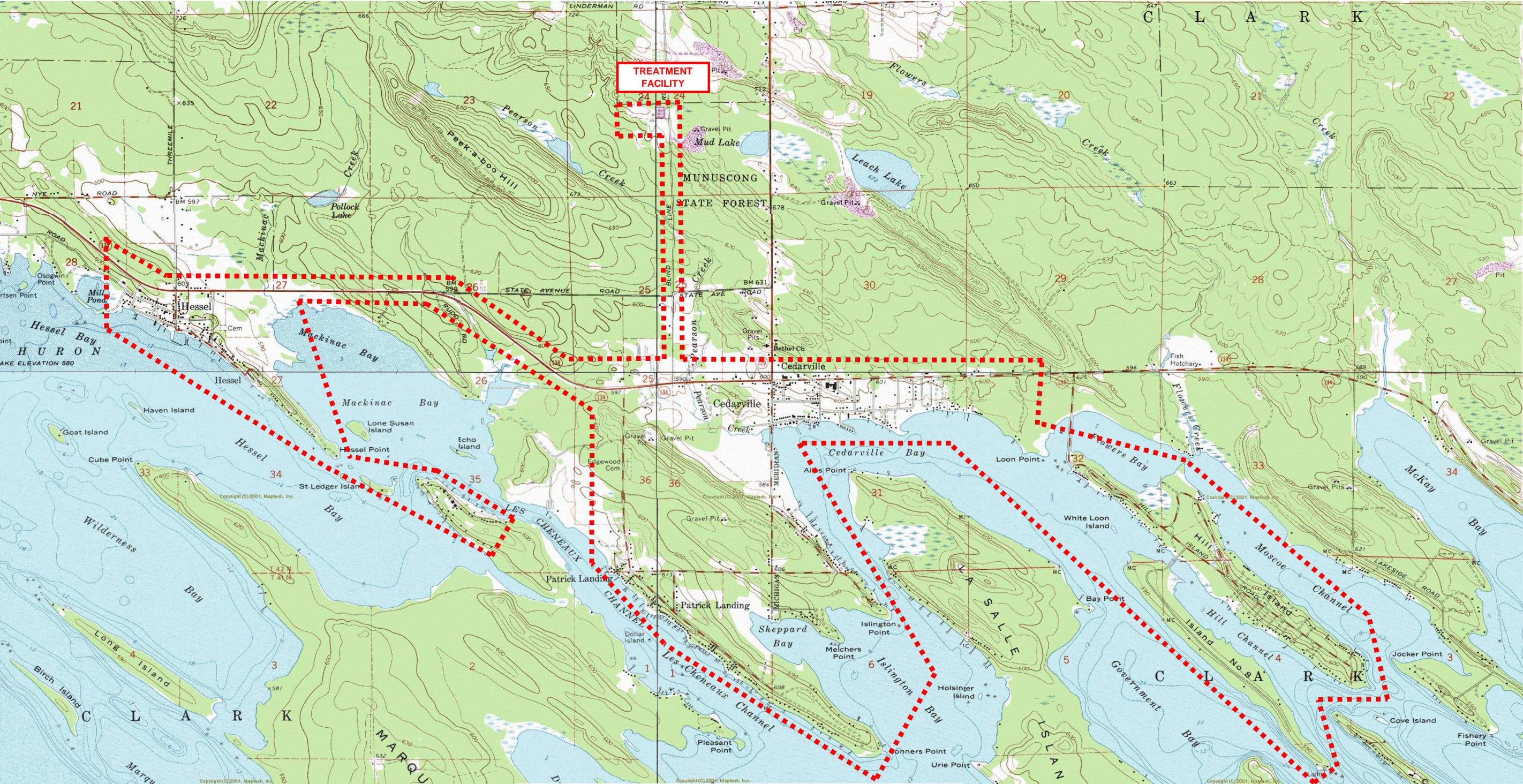
The Lake/Bay-side communities of Hessel and Cedarville are located wholly within the Township. The Township offices are located on Blind Line Road just north of M-134 and northwest of Cedarville.

The primary developed area of the Township is along highway M-134 running east-west through the southern "mainland" portion of the Township, including Hessel and Cedarville and commercial development along the highway. Much of the wastewater service area also includes additional developed shoreline property on Hessel Point, 4 Mile Block Road, Conners Point, Melchers Point, Islington Point, Loon Point, Hill Island and Island No. 8. The only significant natural boundary around the Township is Lake Huron to the south.

Topography within the Township can generally be classified as level to gently rolling. Lake Huron lies at approximately elevation 580' with ground through the well-developed portion of the Township running 590 to 650 feet.

Figure 1. Project Location





■■■■■■■■■■ WASTEWATER SERVICE AREA

FIGURE 2: PROJECT AREA TOPOGRAPHIC MAP

Environmental Setting

Supplemental information on the environmental setting is contained in Appendix C.

Cultural Resources

The proposed construction will be within previously disturbed areas. It is expected that there will be no long term impact to cultural resources.

The Natural Environment

Air Quality

Project area air quality can be described as good to excellent. There are no large industrial facilities which can adversely affect air quality. Limited population also means limited transportation system initiated air quality impacts.

Wetlands

There are scattered pockets of wetlands within the Township.

Coastal Zones

The project area is surrounded by Lake Huron to the south. No work is anticipated near existing surface waters. There are seasonal waterfront residences and lakeside resorts along Lake Huron in the project area.

Floodplains

Floodplains or high water marks exist along the shoreline of Lake Huron.

Natural or Wild and Scenic Rivers

There are no designated natural or wild and scenic rivers in the project area.

Major Surface Waters

The Township lies on the northern shore of Lake Huron. The area's weather, economy, and history are dominated by the lakeshore. Tourism, recreational boating, and fishing thrive in the lakeshore area.

Recreational Facilities

The major economic characteristic that could affect population change in the Township is the overall midwest economy and its effect on tourism and recreational living. The area employment is dependent on tourism. Recreational development (summer homes, commercial rentals, etc.) in outlying Township areas is in part dependent on the availability of drinking water and wastewater disposal. Below in Figure 3 is a map of the recreation and community facilities from the Township's Master Plan.

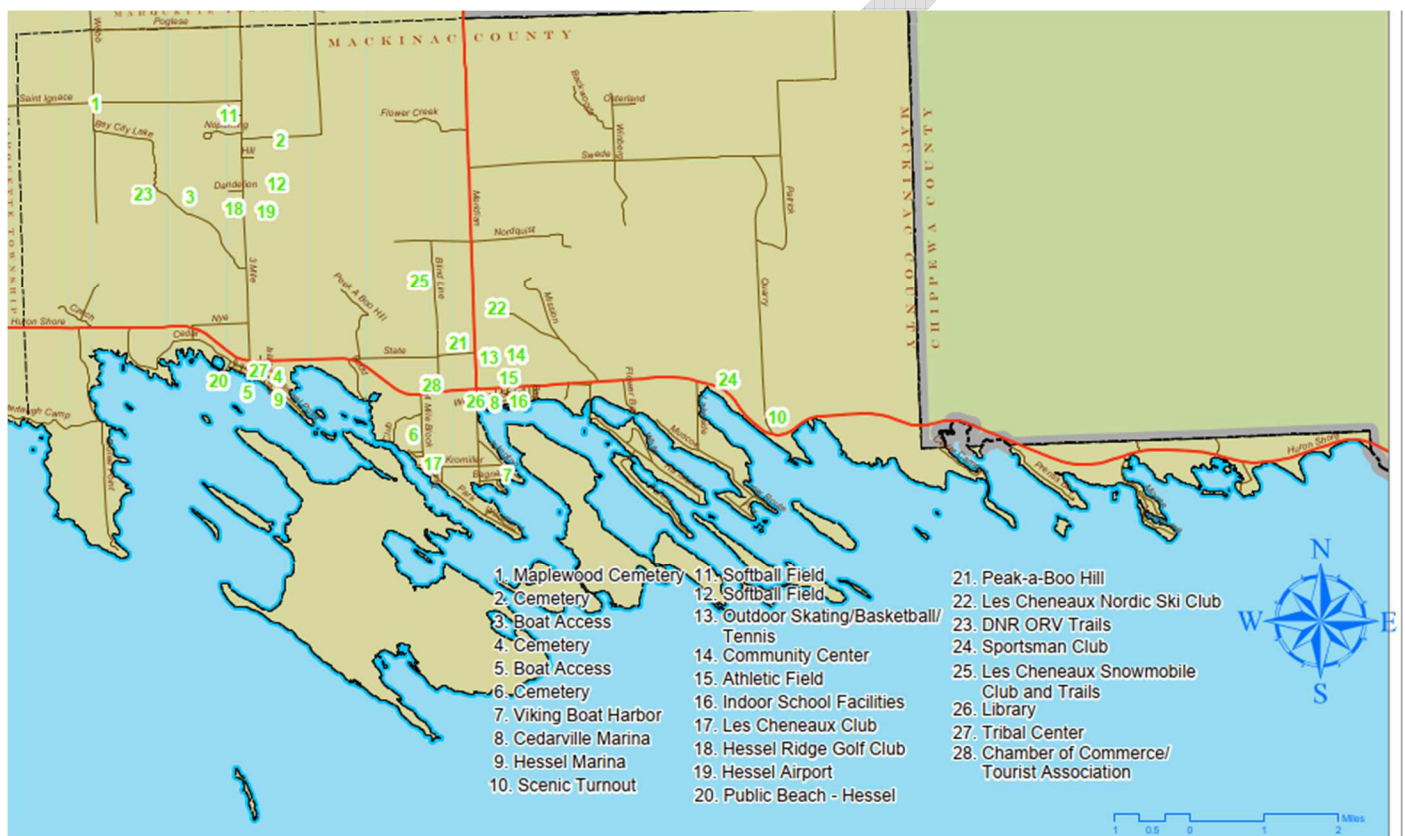


Figure 3. Recreation Facilities in Clark Township

Topography

A topographic map of the project area has been included as Figure 2. Ground elevations are generally flat especially in the proposed project areas.

Geology

Below is an excerpt from the *2015 Master Plan* (see Appendix D):

The geology of the Township reveals that more than half of the area has bedrock within ten feet of the surface. Generally, if bedrock is within ten feet of the surface, the overlying land is considered unsuitable for residential, commercial, and industrial development, particularly where public sewer and water facilities are not available. Areas with shallow bedrock have severe limitations for on-site sewage disposal systems. Most of the bedrock which lies under the Township is known as Paleozoic rock, which consists of limestone or engadine dolomite

Soils

USDA Natural Resource Conservation Service (NRCS) has published its Soil Survey of County. Soils and geology maps and type descriptions can be found in Appendix C.

Agricultural Resources

The Township's Master Plan reports 609 acres of cropland and 11 acres of permanent pasture/other agricultural land of the 51,000 acres in the Township.

Fauna and Flora

The project area is residential and commercial in nature with private (hotel) lawn areas and parking lots or driveways.

Land Use

Land within Township is primarily residential and commercial, driven by tourism. Figure 4, from the Township's Master Plan, shows the land use in the Township. According to the Master Plan, the Township covers approximately 51,000 acres of which 74 percent is non-wetlands forested and 15 percent wetlands.

Within Mackinac County the principal land use is forestry with approximately 90 percent of the land area forested. The majority of the forest land is owned and administered by the U.S. Forest Service or Michigan Department of Natural Resources. Developed land is predominantly residential and light commercial with less than one percent designated for industrial use.

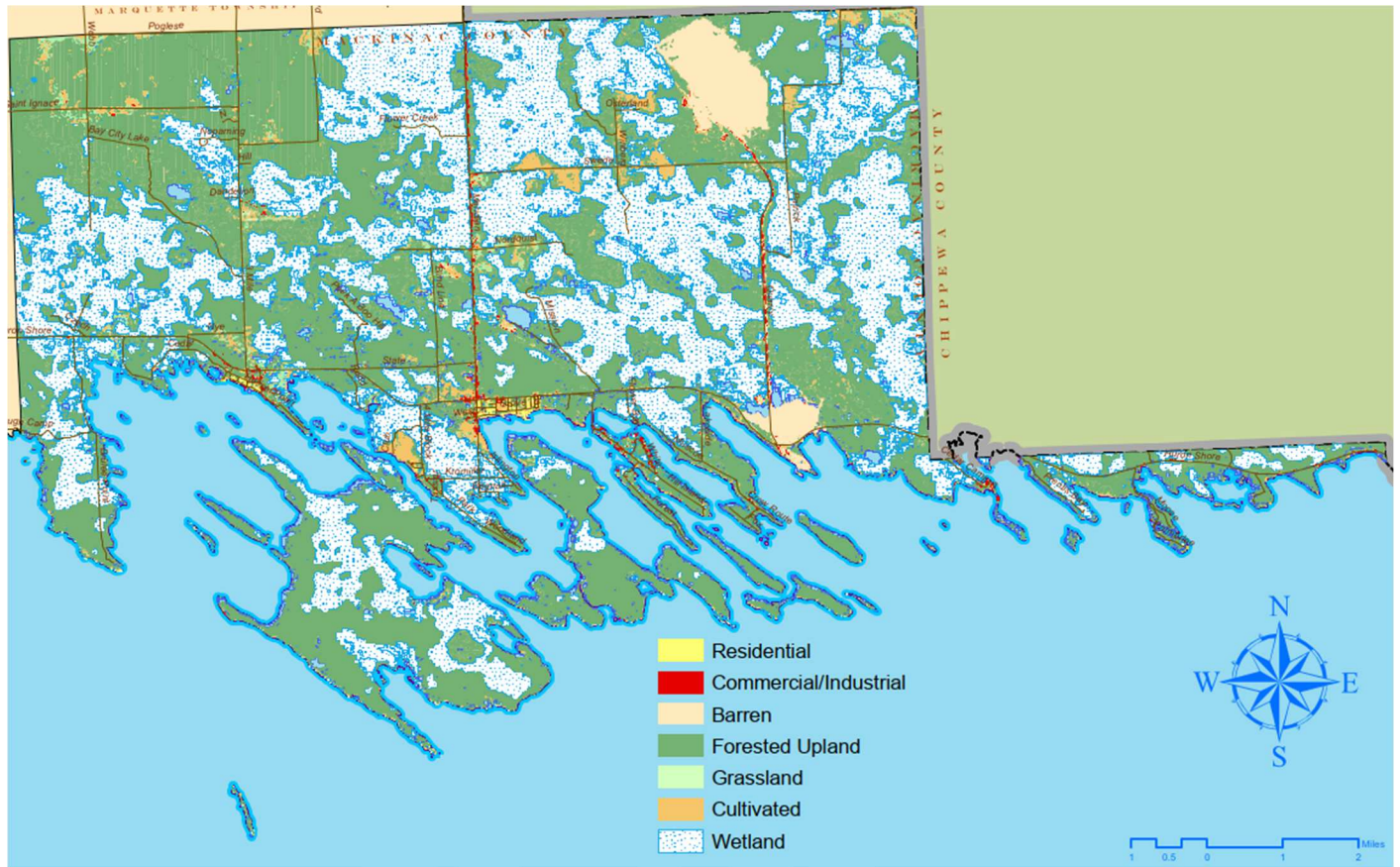


Figure 4. Land Use

Population

Although both Township and County population has declined slightly in the past decade, the totals are expected to stabilize. Up and downturns in the economy affect the numerous lakeside resorts in the area but have less effect on the area population. Historic and estimated future populations are presented in Table 1 below:

Table 1. Population Projections

Year	Clark Township	City of St. Ignace	St. Ignace Township	Moran Township	Mackinac County
1960		3,334	686	877	10,853
1970		2,892	551	779	9,660
1980	1,879	2,632	706	823	10,178
1990	2,012	2,568	932	838	10,674
2000	2,200	2,678	1,024	1,080	11,943
2010	2,056	2,452	939	994	11,113
2020	1,917	2,500	900	1,000	11,100
2030 (b)	1,917	2,500	900	1,000	11,100
2040 (b)	1,917	2,500	900	1,000	11,100

(a) 1960 to 2020 based on published US Census figures

(b) 2030 to 2040 assumes population stabilizing as economy stabilizes

Economic Characteristics

Within Mackinac County the principal land use is forestry with approximately 90% of the land area forested. The majority of the forest land is owned and administered by the U.S. Forest Service or Michigan Department of Natural Resources. Developed land is predominantly residential and light commercial with less than one percent devoted to industrial use. Commercial interests in both the Township and County are driven by service to either the small local communities or the influx of summer tourists.

The Township is located along the shoreline of Lake Huron. The area's weather, economy, and history are dominated by the lakeside. Tourism, recreational boating, and fishing thrive in the area. Table 2, below, from the *2015 Master Plan*, summarizes the economic characteristics of the project area.

Table 2. Major Employers of Project Area (by Percentage)

Employment Sector	Clark Township	Mackinac County
Agriculture, Forestry, Fishing and Hunting, and Mining	0.6	3.4
Construction	15.7	8.5
Manufacturing	6.0	3.3
Wholesale Trade	0.0	0.7
Retail Trade	10.7	10.5
Transportation and Warehousing, and Utilities	3.9	5.0
Information	0.5	0.9
Finance and Insurance, and Real Estate and Rental and Leasing	9.4	6.1
Professional, Scientific, and Management, and Administrative and Waste	6.8	5.4
Education Services, and Health Care and Social Assistance	24.6	21.1
Arts, Entertainment, and Recreation, and Accommodation and Food Services	7.6	19.9
Other Services, Except Public Administration	8.0	6.7
Public Administration	6.2	8.7

Existing Facilities

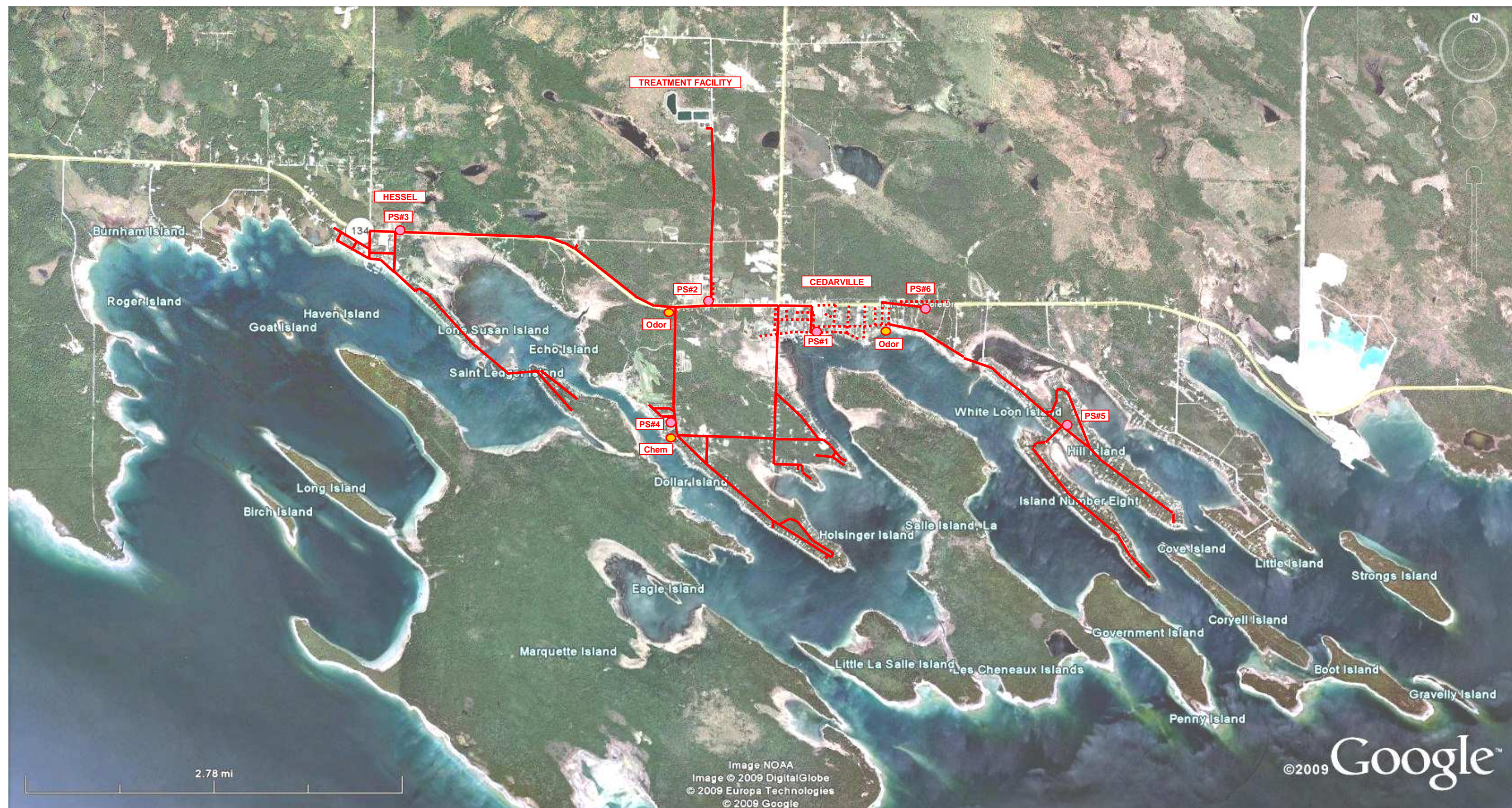
Figure 2 shows the Clark Township wastewater collection system service area. Nearly all of the developed areas in Clark Township are now served with the exception of residential shoreline developed areas on Marquette and La Salle Islands. The wastewater system currently serves 873 customers, 740 of which are residential. There are no major industrial/manufacturing users discharging into the wastewater collection system. Because the system serves lakeshore communities, the collection system is primarily made up of approximately 700 individual grinder pump stations with pressurized collection lines.

Figure 5 notes the location of the various Township wastewater system components. The aerated lagoon treatment facility is located on Blind Line Road approximately 1.3 miles north of M-134 and the community of Cedarville. The community of Cedarville contains the oldest portions of the collection system and is primarily served via the original 1970s era gravity sewers. The remainder of the collection system is made up of individual grinder pump stations sized to reflect the demands of the residence or commercial entity served. There are six major pump stations within the collection system located as follows:

- Pump Station No. 1 – Located just south of Highway M-134 in Cedarville and serving the Cedarville area
- Pump Station No. 2 – Located at the intersection of Blind Line Road and Highway M-134 serving the entire collection system and pumping to the treatment facility
- Pump Station No. 3 – Located on highway M-134 on the north side of Hessel serving the community of Hessel

- Pump Station No. 4 – Located on the south end of 4 Mile Block Road serving that area and the Conners, Melchers and Islington Points areas
- Pump Station No. 5 – Located on Hill Island serving Hill Island and Island No. 8
- Pump Station No. 6 – Located on M-134 just east of Cedarville currently serving primarily small commercial customers

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- FORCE MAIN WASTEWATER COLLECTION ROUTE
- GRAVITY SEWER WASTEWATER COLLECTION ROUTE
- MAJOR PUMP STATION
- ODOR CONTROL OR CHEMICAL FEED STATION

FIGURE 5: EXISTING WASTEWATER FACILITIES

Below is a description of the collection system areas (system is summarized in Table 3):

- Cedarville – 1.5 mi of gravity collection sewers
- Hessel – 179 simplex (one pump), two duplex (two pumps) grinder stations and 10,000 ft of force main
- Hessel Point – 28 simplex grinders and 3,000 ft of force main
- 4 Mile Block Area – 172 simplex, one duplex grinder stations and 18,000 ft of force main
- Islington Point Area – 88 simplex grinders and 12,000 ft of force main
- Loon Point – 13 simplex grinders and 4,000 ft of force main
- Hill Island & Island No. 8 – 180 simplex grinders and 21,000 ft of force main
- Other Areas – 40 grinders and 14,000 ft force main
- 32,000 ft of connecting transmission (8 to 10-inch) force main

Table 3. Summary of the Existing Wastewater System

Collection Sewer								
Sewers	Footage	Material	Age	Condition		Manholes	Age	Condition
8-inch	2,000	VCP	< 30 years	Fair/Good		Gravity (50)	< 30 years	Fair
10-inch	5,000	VCP	< 30 years	Fair/Good			Force Main (40)	< 30 years
2 to 10-inch Force Main	104,000	HDPE	< 30 years	Good				
Lift Stations								
L.S. No.	Type	Pump Capacity	Install Year	Condition	Location			
1	End Suction	250 gpm		Poor	South of M-134 in Cedarville			
2	Submersible	900 gpm	2001	Good	M-134 & Blind Line Rd.			
3	End Suction	250 gpm	1994	Fair	M-134 in Hessel			
4	End Suction	250 gpm	1994	Good	South end of 4 Mile Block Rd.			
5	End Suction	200 gpm	1994	Fair	Hill Island			
6	Submersible	150 gpm	2003	Good	M-134 East of Cedarville			
Grinder Pumps		700 ea	Varies	Poor	Various			
Aerated Stabilization Lagoon System								
Description		Volume		Notes				
Aeration Lagoons		2 @ 1.5 Mgal Each		Four Aerators Each (Eight Total) @ 7.5 hp each				
Storage Lagoon		2 @ 12 Mgal Each						
Storage Lagoon		1 @ 14 Mgal Each						
Discharge		25 to 35 Mgal						

Clark Township has an aerated stabilization lagoon system that was originally installed in 1991 and upgraded in 2001 with a third lagoon. The lagoons discharge twice per year in spring and fall at a maximum of ten days continuous (before

June 1st and after September 30th). The outfall is an 18-inch sewer along Blind Line Road to Pearson Creek, then to Cedarville Bay to Lake Huron. Below are the discharge criteria for the lagoons:

- Maximum flow rate: 0.4 MGD
- Dissolved Oxygen: 5.0 mg/L
- Biological Oxygen Demand (BOD): 30 mg/L
- Total Phosphorus: 1.0 mg/L
- Total Suspended Solids: 70 and 40 mg/L

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Fiscal Sustainability Plan (FSP)

As part of this study, an asset management and capital improvement plan is proposed to be implemented concurrently with the SRF funding milestones.

Need for the Project

Orders or Enforcement Actions

The Township does not currently have any court or enforcement order against it.

Water Quality Problems

The ultimate goal of wastewater treatment is to protect the quality of the waters of the State and protect the health of the public. Reliable operation of the wastewater collection system within the Township's utility systems directly impacts the health and safety of the Township's citizens and visitors. Deficient sewers can contaminate ground and surface waters, and contribute to the system's ability to adequately treat wastewater. The system has experienced sewer main backups/SSOs that pose health risks and significant repair expenses and legal fees (refer to Appendix D for list of backups in project location in recent years).

Projected Needs for the Next 20 Years

Project area equivalent population is anticipated to stabilize. Increased treatment capacity is not a goal of this Project Plan and any subsequent project. Projected needs concentrates more on the systems reliability and replacement/enhancement of the existing treatment systems to protect the existing system. The current wastewater system was constructed in the early 1990s. Pipes and manholes are still within their life expectancy and will not require replacement with the next 20-years. However, equipment is reaching the end of their useful life and will require replacement within the next 20-years. This includes replacement of all grinder pumps and replacement of lift stations. Upgrades will also need to be made at the lagoons; which include but are not limited to: pipe to storage pond to supply golf course, upland spray irrigation, and an alternative lagoon discharge continual to Pearson Creek.

The Township is concurrently applying for funding for asset management (AMP) and capital improvement planning (CIP). This would be structured similar to the Stormwater, Asset Management and Wastewater (SAW) Program and includes inventorying and inspection of the system. An abbreviated AMP and CIP, as part of the FSP, will be developed concurrently with the funding milestones as stated in the previous sections.

Future Environment without the Proposed Project

With population and growth within the project area stabilizing, existing capacity for future generated wastewater is adequate.

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ANALYSIS OF ALTERNATIVES

Clark Township has invested in regular maintenance and future planning for improvements to their lagoons and collection system. This Project Plan examines alternatives for development in the next five to twenty years. As part of the Selected Alternative, the Township will include costs to develop a FSP for the outlined project scope.

Potential Alternatives

No Action

The No Action alternative, although saving a large initial capital investment, would result in several and continuing adverse impacts on the Township's wastewater system and its customers. Those impacts include, but may not necessarily be limited to, the following:

- Continued risk of system failure
- Continued decrease in the reliability of waste treatment and increased risk to water quality of the Great Lakes
- Continued and accelerated degradation of the system along with increased maintenance costs.
- Continued use of excess energy
- Continued sewer main backups/SSOs due to failing pumps (refer to Appendix D for summary of backups in project area)

Optimum Performance of Existing Facilities

The Township has been working toward optimizing its collection system. The Township has achieved what it can with the current infrastructure. Optimizing of the existing system alone, without capital improvements, will fail to incorporate improved technologies; will fail to restore the service life to facilities and system; will fail to take advantage of improvements to reduce energy use; and will fail to improve the sustainability of the system. The principal alternatives described below can be considered an extension of this concept, but one that requires significant capital improvements.

Water and Energy Efficiency

Selected equipment shall have greater energy efficiency verses original components.

Regional Alternatives

The Township operates as the centralized facility for the community. The lagoons are maintained and operating well, and therefore, regionalization will not be analyzed as a proposed alternative.

Principal Alternatives

Alternative 1: No Action

Not implementing a corrective measures project at this time while attempting to correct deficiencies in the system utilizing existing maintenance budgets: No Action will result in continued sewer main backups/SSOs (refer to Appendix D for summary of backups in project area). This includes continued expenses for damage to residential buildings due to failures in the system.

Alternative 2: Replacement of Grinder Pumps

Replacement and upgrading where required to address EOne Grinder Pumps, complete tank replacement, and upgrade of pump controls and alarms in the system based on Township records and personnel knowledge. This equipment is beyond their useful service life. Some excavation around grinder pumps may be required to install; however, disturbed areas will be minimal. This alternative will aim to eliminate SSOs/sewer main backups within the system due to failing pumps.

ANALYSIS PRINCIPAL ALTERNATIVES

The Monetary Evaluation

A construction estimate is provided in Table 4. Costs were estimated using quotes from vendors (refer to Appendix A for similar equipment pricing) and inflated to adjust to current bidding environment. The construction estimate does not include install costs and are for equipment only; the Township will use their own personnel for installation of pumps. No additional monies are being requested for force account. Pump costs may vary due to current bidding environment trends; costs may be reduced due to quantity ordered and time ordered.

Table 4. Construction Cost Estimate

Description	No. of Replacements	Cost per Unit	Total Cost
EOne Grinder Pumps with New Controls	650	\$4,900	\$3,190,000
Complete Tank Replacement	50	\$1,000	\$50,000
Pump Control Upgrades Only	50	\$1,600	\$80,000
Total Cost of Equipment			\$3,320,000

A 20-year present worth analysis is also included in Table 5 below. O&M impacts were assumed to effect grinder pump operations only for this analysis. The anticipated savings in operating expenses is represented as negative “O&M impacts.” Likewise, the “no action” alternative indicates escalating expenses as utility rates increase and energy efficiency decreases.

O&M costs include an increase for an annual subscription of \$56,000 to an alarm system to notify personnel of issues within the system. A reduction of \$20,000 in O&M is added for less costs of maintaining pumps at the end of their life and less frequent visits to pumps. The life expectancy is 20-years for a pump; thus salvage value at the end of 20-years is zero.

Table 5. Present Worth Analysis

Item	Description	Alternative 1: No Action	Alternative 2: Replace Grinder Pumps
1	Construction Costs	\$0	\$3,320,000
2	Engineering, Legal, Administration, Planning, and Contingencies	\$0	\$280,000
3	Total Capital Cost	\$0	\$3,600,000
4	Change in Annual O&M Costs	\$0	\$36,000
5	Present Worth of O&M Costs	\$0	\$740,000
6	Salvage Value	\$0	\$0
7	Present Worth of Salvage Value	\$0	\$0
8	Total Present Worth	\$0	\$4,340,000

Table row description for Table 5:

1. Construction costs developed from vendor quotes and detailed in Appendix A.
2. Project support fees based on a percentage of construction costs. Table 8 further breaks this total cost down for Alternative 2.
3. Capital costs are sum of 1 and 2.
4. O&M costs are based on the full budget, adding or subtracting impacts throughout the system.
5. Present value of O&M costs for 20 years at -0.25% (per 2022 USDA/SRF guidance).
6. Land considered permanent, 50-year life for piping and valves, 50-year life for structures, 20-year life for repairs, and 20-year life for equipment (pumps).
7. Present worth of line 6 at -0.25% interest for 20 years.
8. Total of items 3 and 5 minus 7.

Partitioning of the Project

The Township intends to partition the total collection system needs into numerous construction phases over the next several decades to enable improvements to within the limited financing capability of the service district. Upgrades to the grinder pumps are expected to be phased over the next three years by Township personnel.

The Environmental Evaluation

Correspondence related to environmental impact aspects of this project can be found in Appendix C. Table 6 below summarizes potential environmental and public health impacts of the evaluated alternatives. Based on the CWSRF Intent to Apply (ITA) Meeting for this project, the project has been classified as a non-equivalency project.

Table 6. Environmental Evaluation

Category	Alt. 1: No Action	Alt. 2: Pump Replacement
Cultural Resources:		
- Historical/Archaeological	0	0
Natural Environmental:		
- Climate	0	0
- Air Quality	0	0
- Wetlands	0	0
- Coastal Zones	0	0
- Floodplains	0	0
- Natural Wild and Scenic Rivers	0	0
- Surface Waters	1	0
- Topography	0	0
- Geology	0	0
- Soils	1	0
- Agricultural Resources	0	0
- Sensitive Habitats	0	0
- Threatened or Endangered Species	0	0
- Unique Features	0	0
Total (lower is less impact)	2	0

Implementability and Public Participation

The Township has completed large construction projects over the past several decades. All are openly discussed at public meetings, including with cost impacts. The Project Plan was advertised and displayed for citizen review for one month prior to a formal Public Hearing. The Township contracted with an engineering design consultant (C2AE) for assistance in the planning process. This project may utilize quality based selection for their design consultant; this would be required by the SRF program if dictated an equivalency project. They will also contract with a bond counsel for assistance in arranging project funding.

Technical Considerations

Infiltration and Inflow (I/I) Removal

There will be no I/I removal issues resolved in this project.

Structural Integrity

It has been observed by Township personnel that the grinder pumps throughout the project area are in imminent failure. The structural integrity of the pumps is beyond repair. Without substantial capital investment for replacement of these pumps will cause continued backups in the system and continued litigation problems with customers.

Sludge and Residuals

The proposed improvements will not affect quality of sludge or residuals.

Industrial Pretreatment

It is not expected that the improvements recommended under the alternatives will have a positive or negative impact on industrial pretreatment issues.

Growth Capacity

It is not anticipated that there will be a need for growth capacity in the 20-year future planning period.

Areas Currently Without Sewers

Developed areas within the project area are all currently served.

Alternative Sites and Routings

All improvements under the principal alternatives are contained on the existing site. Considerations for alternate siting and routing are minimal due to the extensive infrastructure already in place.

Combined Sewer Overflows (CSO)

There are no known combined sewer overflows associated with the Township.

Contamination at the Project Site

There are no known contamination sites within the project area.

Green Project Reserve

The proposed project does not include green infrastructure, water, nor energy improvements.

SELECTED ALTERNATIVE

Alternative 2 to replace pumps, tanks, and pump controls is the selected alternative because it provides the most cost effective option to provide improvements to structural deficiencies within the system. Some excavation around grinder pumps may be required to install and reconnect; however, disturbed areas will be minimal. This selected alternative also includes costs for developing a FSP for the proposed project.

Relevant Design Parameters

Pump replacement will conform to current EGLE standards. Grinder pumps will be replaced in existing locations and designed according to location, head loss, and total flows. Environmental issues that arise during design will be addressed via EGLE and local and county permitting processes. Wastewater collection deficiencies to be corrected are prioritized based on Township personnel knowledge of problem areas and existing pump age.

Project Maps

Below is a list of the maps presented in this report:

- Figure 2. Project Area Topographic Map
- Figure 5. Existing Wastewater Facilities

Controlling Factors

Planning and design will be in accordance with applicable industry standards including:

- EGLE and USACE Permitting Requirements
- OSHA and MiOSHA Requirements
- SHPO and THPO Requirements
- EGLE and Ten States Standards
- Regional Utility Standards
- NFPA 820 Standards

Special Assessment District Projects

A special assessment district is not planned nor applicable to this project.

Sensitive Features

Work will take place in previously disturbed areas with in right-of-ways; replacement pumps will be installed in location of existing pump. Areas will be isolated from any potential sensitive environmental locations. It will be necessary to protect the waters of the Great Lakes during construction.

Schedule for Design and Construction

The schedule for design and construction is presented in Table 7 below and follows second quarter funding. The Township expects to have the equipment purchased installed over a three-year time period from awarding bid.

Table 7. Project Schedule

Item	Target
CWSRF Application Submittal	June 2022
CWSRF Acceptance	Summer 2022
Funding Commitment	Summer 2022
Start Design	Fall 2022
Land & Easements Acquisition	N/A
Permits	Winter 2023
Advertise for Bids	Winter 2023
Funding Closing	Spring 2023
Contract Award	Spring 2023
Construction	Spring 2023
Substantial Completion	Fall 2025
Final Completion & Initiation of Operation	Fall 2025

Cost Summary

A brief summary of planning, design, and construction costs is included below in Table 8.

Table 8. Project Cost Summary

Item	Est. Total
Construction	\$3,320,000
Administration, Legal, Bonding, Permits, & Miscellaneous	\$42,000
Planning (excluded from engineering total)	\$35,000
Design	\$14,000
Bidding	\$5,000
General Engineering During Construction	\$15,000
Post Construction Services	\$3,000
Resident Project Representative	\$19,000
Additional Services – Design Related	\$5,000
Additional Services – Construction Related	\$17,000
<i>FSP (Asset Management & Capital Improvement Plan)</i>	\$20,000
Engineering Total	\$133,000
Contingencies	\$105,000
Total Project Cost	\$3,600,000

Authority to Implement the Selected Alternative

The Township has successfully implemented wastewater system improvements projects over the past 50 years. The Township has shown it has the legal, institutional, technical, financial, and managerial resources to accomplish implementation of the recommended alternatives.

User Costs

Table 9 demonstrates the impact on user rates that may be possible with a project of this size. This breakdown assumes a 20-year debt service on the bond at an interest rate of 1.875% (2022 interest rate). O&M is expected to decrease, but will be maintained at existing rate for conservative budgeting.

Table 9. User Costs

Description	Value
CWSRF Loan Amount	\$3,600,000
Anticipated Interest Rate	1.875%
Term	20 years
Annual Debt Service	\$217,517
Monthly Debt Service	\$18,126
Estimated System EDUs	1,177
User Rate Impact / EDU / Month	\$15.40
User Rate Impact / EDU / Quarter	\$46.20

Disadvantaged Community

A “Disadvantaged Community Status Determination Worksheet” is included with the final Project Plan submittal (see Appendix B). According to guidelines, the Township does qualify as a disadvantaged community considering their current and projected debt service, median household income, and user rates.

Useful Life

For new capital improvements including those under the proposed SRF project, the total useful lives are as listed below based on methodology for salvage value computation.

- Building: 40 years
- Underground facilities including piping and foundations: 50 years (100 years expected based on performance of existing systems)
- Short-lived equipment: 20 years (30 to 40 years expected based on performance of existing equipment)

The system was constructed in the 1990s and is well maintained. Piping and structures are still within the useful life expectancy in the 20-year project planning scope. However, this Project Plan outlines equipment installed in the 1990s that is past its useful life (30 years old).

ENVIRONMENTAL EVALUATION

Summary

A cursory environmental review has been performed and the findings are included within Appendix C. Based on the ITA Meeting for this project, the Project has been classified as a non-equivalency project, therefore no further review is needed as part of the project plan.

Analysis of Impacts

Direct Impacts

Construction Impacts

Construction activity impacts will be short term as previously noted and are not expected to be unusual for underground utility or building construction. Implementing the improvements will reduce overall system operation and maintenance efforts due to replacement of outdated equipment and installation of newer, more reliable equipment.

Operational Impacts

No changes in odors, noise, traffic, or accident/spill potential are expected from the selected alternative. Updating systems to more reliable and efficient operation helps to minimize adverse operational impacts. Implementing the improvements will reduce overall system operation and maintenance efforts due to replacement of outdated assets and installation of newer, more reliable system.

Social Impacts

The project segments will create short term economic benefits in areas of construction employment and materials supply. No relocation of residents or businesses is expected to result from the project. Long term human, social, and economic impacts will be positive through increased efficiency and reliability in area infrastructure. Construction is not anticipated to have any adverse effect on historical, archaeological, geological, or recreational areas.

Indirect Impacts

Land Development

The project will occur on previously disturbed areas or rights-of-way and should not induce changes in rate, density, or type of land development nor associated transportation routes.

Land Use

The project is not expected to change current land use patterns.

Air and Water Quality

Air and water quality changes stemming from primary and secondary development are expected to be temporary and minor to non-existent.

Secondary Growth

Secondary growth is also not expected other than that of any well run and maintained utility system.

Cultural Impacts

Impacts generated by the recommended improvements on cultural, human, social, and economic resources can only be considered beneficial in the long term. Continued efficient and reliable operation of the area's utility system(s) contributes to a stable infrastructure promoting public health and safety.

Aesthetics

The projects will produce no overall permanent damage to existing area aesthetics.

Resource Consumption

No additional or increased resource consumption will occur due to these projects other than the construction related issues previously noted.

Cumulative Impacts

No additional development incentive is expected to be created other than what occurs by default with improvements to a utility system.

MITIGATION MEASURES

General

Where adverse impacts due to installation of the recommended improvements cannot be avoided, mitigation measures will be implemented. Costs for mitigation measures were considered and included where applicable in project opinions of probable cost. Mitigation measures needed during construction will be included in construction contract documents.

Short-Term Construction Related Mitigation

Traffic

Any traffic disruptions that occur (such as equipment deliveries or construction-related traffic) will be organized and controlled to minimize disruption of local, transient, and emergency traffic. All needed barriers and signing or flagging will be in conformance with applicable Authority, County, and MDOT standards.

Safety

All work shall comply with Federal, State, and local laws governing activities, safeguards, devices and protective equipment. Minimum requirements are defined by the U.S. Department of Labor and the Michigan Occupational Safety and Health Act.

Dust and Noise

Construction dust and noise will be required to be kept to a minimum. Use of water or other suppressants will be used to control fugitive dust and prevent violation of Rule 901.

Erosion

A Soil Erosion and Sedimentation Control permits will be required for the project. Site specific mitigation measures will be addressed during design and included in the construction contract documents. For this project, there is very little anticipated site disturbance.

Restoration

Damaged curbing, driveway, and sidewalk surfaces will be restored to equal or better condition in accordance with best modern practices; however, disturbances are not expected. Undeveloped areas will be restored with topsoil, fertilizer, mulch and seed or sod as needed in a timely manner. All disturbed site soil will be restored with topsoil, seed, fertilizer, and mulch. When final restoration will not occur within 14 days of disturbance, temporary seed and mulch will be required.

Utilities

Disruption of utilities during construction will be kept to the minimum necessary to allow new installations. Repairs will be made in a timely manner. Careful sequencing with Owner is required in construction contract to avoid interruptions to the treatment process. No untreated or partially treated discharge of effluent to Lake Huron will be allowed.

Valuable Features

Implementation of the selected alternatives is not expected to significantly impact more extensive or valuable existing features such as mature vegetation.

Mitigation of Long-Term Impacts

General Construction

It is not anticipated that there will be any long term impacts from the general construction activities.

Siting

Work will be confined to existing developed areas and in existing rights-of-ways.

Operational Impacts

Long term operational issues will not be adversely changed by the projects; rather, operations should be enhanced through new more reliable equipment installations.

Mitigation of Indirect Impacts

Master Plan and Zoning

Long range planning by the Authority identified the project segments evaluated in this report and all take place within existing disturbed or developed areas and rights-of-ways and will have no effect on planning and zoning in the community.

Ordinances

Local ordinances are in place regarding minimum building construction and operation standards and site erosion control. Wetlands, floodplains, and other sensitive habitats are protected by State laws and permitting procedures.

Staging of Construction

Staging will not be necessary..

Construction Problems

Construction problems anticipated include groundwater control and areas of inferior structural/pipe bedding and backfill soil material. These are normal occurrences with construction in the area and prior planning/design will create a situation where these problems will pose no significant difficulties for qualified contractors.

DRAFT

PUBLIC PARTICIPATION

Public Meeting

The Clark Township wastewater system needs and generic potential fixes have been openly noted at several Township meetings over the past decade. The Township has held several open meetings over the past years where there were discussions regarding the collection system.

Public Hearing

An initial public hearing on the information presented in this report was held during a regular Township meeting on May 18, 2022. A written transcript is included in Appendix E.

Public Hearing Advertisement

An advertisement was placed in the St. Ignace News 30 days prior to the Public Hearing on April 14, 2022. Simultaneously to the advertisement publication, copies of the Project Plan were made available to the public at the Township Hall and on the Township's website. Appendix E includes the advertisement copies.

Public Hearing Transcript

A full transcript of the public hearing is available in Appendix E.

Public Hearing Comments

Comments are summarized in Appendix E with a full transcript.

Comments Received and Answered

No written comments were received prior to the Public Hearing.

Adoption of the Project Plan

Agency and/or Owner preliminary review comments were incorporated into the final version of this Project Plan. The plan was adopted by Clark Township on May 18, 2022.