SANITARY SEWER
ASSET MANAGEMENT PLAN

FOR

BERGLAND TOWNSHIP

NOVEMBER 2018

PREPARED BY:
COLEMAN ENGINEERING COMPANY
ON BEHALF OF BERGLAND TOWNSHIP

COLEMAN ENGINEERING COMPANY

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TABLE OF CONTENTS

APPENDIX A - FIGURES

APPENDIX B - TABLES

1.0 EXECUTIVE SUMMARY

The development of this Sanitary Sewer System Asset Management Plan (AMP) is a result of the Stormwater, Asset Management, and Wastewater (SAW) Grant funded by the Michigan Department of Environmental Quality (MDEQ). The purpose of this AMP is to provide structure and guidelines for the use and maintenance of Bergland Township's sewer system which will ensure the continued protection of public health and the environment.

The mission statement of Bergland Township is to provide customers with an effective, efficient and environmentally sound method of sanitary sewer collection, treatment and disposal, while complying with Federal and State laws, administrative rules and operating permits.

Bergland Township's sewer system consists of gravity and forcemain sanitary sewer main, two duplex pump lift stations, and wastewater stabilization lagoons. The estimated current replacement value of the Bergland gravity sewer system and wastewater stabilization lagoons is approximately $5.5 – 6 million, with the value of the Merriweather Forcemain System at approximately $5 – 5.5 million.

Throughout the summers of 2016 and 2017, an asset inventory and condition assessment of Bergland Township sewer system was performed. GPS survey, visual inspections, smoke testing and video televising of the system were performed. This inventory was then reviewed to determine the condition of the assets.

Overall, visual inspections indicated that the majority of the gravity and forcemain manholes are in fair to good condition, with 14 percent being classified as fairly poor or poor. The majority of faults in the fairly poor to poor condition manholes are due to infiltration.

Smoke testing results located a number of possible sources of I&I. Of 14 total incidents, 8 were identified as uncapped clean-outs or broken laterals, thus having significant potential for I&I. Another possible source of I&I was a large pick hole in all of the manhole castings, which was found through visual inspection and smoke testing.

Information from visual inspections and smoke testing operations helped in determining which sewer mains should be further inspected by a closed-circuit television (CCTV) crew. The televising operations were conducted by sending a robotic video camera through the sewer mains and recording the condition and any irregularities within the sewer main. Video inspection has indicated that most mains were in relatively good condition; however, several problem areas were noted.

This Asset Management Plan summarizes the assessment, rating, budgeting and plan of action to maintain, repair and upgrade Bergland Township's sewer system to comply with the mission statement and Level of Service set forth by Bergland Township.

2.0 ASSETS

The Bergland Township Sanitary Sewer System serves approximately 354 homes and businesses (163 in the Bergland System and 203 in the Merriweather System). The Bergland Township Sewer System was primarily constructed in 1971 and 2012 with other minor expansion and replacements to the system. The Bergland system consists of gravity sanitary sewer, a pump station, force main sanitary sewer, and wastewater stabilization lagoons. The Merriweather forcemain system consists of HDPE forcemain, air relief and flushing manholes, a pump station, and individual grinder pump stations for each property.

Figure A1 – Bergland Township Location Map and Figures A2 & A3 – Bergland Township Sanitary Sewer System in Appendix A, illustrate the service area for Bergland Township.

The following is a general description of assets for Bergland Township.

GRAVITY SANITARY SEWER

Residential and commercial sanitary discharge is collected by the approximately 16,100 feet of gravity sewer mains, including 58 sanitary manholes. The main line system is comprised mainly of 8-inch ABS Truss pipe and precast concrete manholes.

See Table B1 – Sanitary Sewer Gravity Pipe Summary and Table B2 – Sanitary Sewer Manhole Summary in Appendix B for details of gravity sewer assets.

FORCE MAIN SANITARY SEWER

The Bergland Township Lagoon Forcemain consists of approximately 6,550 feet of 6-inch ductile iron forcemain and one air relief manhole. This forcemain transports sewage from Lift Station #1 to the Bergland Township Wastewater Stabilization Lagoons.

The Merriweather Forcemain Sanitary Sewer consists of approximately 70,300 feet of HDPE forcemain with sizes of 1.25-inch, 2-inch, 3-inch, 4-inch and 6-inch diameter piping. This forcemain transports sewage from Lift Station #2 in Merriweather and directly discharges into the gravity sewer system along the south Right-of-Way of M-28 west of the M-64 intersection in Bergland. The Merriweather system includes 199 grinder pump stations, with 40 of these grinder stations pumping directly into Lift Station #2.

See Table B3 – Sanitary Sewer Forcemain Summary located in Appendix B, for details of the Forcemain Sanitary Sewer Systems.

AIR RELIEF MANHOLES AND FLUSHING STATIONS

The forcemain sewer system also contains air relief manholes and flushing stations. The Bergland forcemain contains one air relief manhole. The Merriweather system contains twenty-four air relief manholes and forty-one flushing stations. These air relief manholes and flushing stations are used for servicing and maintenance of the forcemain system.

Table B4 – Sanitary Sewer Forcemain Manhole Summary located in Appendix B, for details of the Forcemain Sanitary Sewer Systems.

PUMP STATIONS

Lift Station #1, the Bergland Township Lagoon Lift Station is the first stage of the Forcemain Sanitary Sewer System. All of the Bergland Township gravity sanitary sewer system discharges into the 4-foot diameter wet well with a depth of 19-feet, this includes the sewage from the

Merriweather Lift Station, which discharges into the gravity systems westernmost manhole. From the wet well the sewage is pumped through two submersible pumps to the Wastewater Stabilization Lagoons.

Lift Station #2, the Merriweather Lift Station receives sanitary sewer from approximately 40 grinder stations in Merriweather and from the Northwest corner of Lake Gogebic south to the Ontonagon County Park. This pump station utilizes two submersible grinder pumps, inside a 6' diameter wet well at a depth of 15-feet. This pump station also contains a 5-foot diameter valve pit with a emergency pump connection and a 4-foot diameter flow meter pit. The sewage is pumped from Lift Station #2 east along Highway M-28 into the Bergland Township gravity sewer system.

The Merriweather Forcemain system contains individual grinder pump stations for each property throughout the service area. There are 199 grinder pumps located in this area. These grinder pump stations collect sewage from each residence or business and pumps it directly into the HDPE force main.

See Table B5 – Miscellaneous Sewer Assets for additional details regarding each pump station's components.

WASTEWATER STABILIZATION LAGOONS

Wastewater is treated at the Wastewater Stabilization Lagoons east of Bergland Township, with treated wastewater being discharged into the West Branch of the Ontonagon River, east of Lake Gogebic. The wastewater stabilization lagoons are a General Permit Covered Facility currently operating under a permit from MDEQ Water Bureau (permit #MIG580330), as required by the National Pollutant Discharge Elimination System (NPDES) which regulates the discharge of treated wastewater into lakes, rivers and streams.

The Wastewater Stabilization Lagoons consist of an influent structure which includes two shear gate valves with handles to control the discharge into the three lined, non-aerated approximately 3.7 million cubic feet (28 million gallons) total volume treatment cells. From the cells, the discharge enters the weir box and flows directly into the Ontonagon River. Associated piping, valves, structures, buildings, ditching, monitoring wells and roadway are considered part of the Wastewater Stabilization Lagoon System.

See Table B6 – Wastewater Stabilization Lagoon Pipe Summary and Table B7 - Wastewater Stabilization Lagoon Structure Summary for details of the Wastewater Stabilization Lagoons.

A bathymetric survey was conducted in the fall of 2018 to determine the sludge depth of Lagoons #1, #2, and #3. The results of the survey, shown in Figure A.4, indicated an average sludge depth in all of the lagoons of less than one foot.

3.0 LEVEL OF SERVICE

Bergland Township has set a Level of Service (LOS) standard that will provide customers with an effective, efficient and environmentally sound method of sanitary sewer collection, treatment and disposal. The LOS includes the proper utilization (planning for maintenance and repairs) of existing facilities while preparing for expansion of the existing system concurrent with development.

A controlling factor of maintaining a high LOS is review of the Business Risk rating of an asset. Business Risk is controlled by the Condition, Probability of Failure and the Criticality of an asset. In essence, it is the rating which indicates the timing in which a particular asset must be repaired or replaced. By making the assets which have high Business Risks the top priority, Bergland Township will be able to maintain a system which delivers the LOS set forth in this AMP.

Bergland Township adopts the following level of service standards:

- Regularly inspect all components of the sewer system to ensure proper operation and maintenance.
- Include a System Maintenance budgetary item which will cover routine maintenance, repair and replacement of existing sanitary sewer system components.
- Include a Capital Improvement Fund in the budget to allow for total system replacement in the future.
- Require that all new development which is located within the service area shall comply with applicable County, State, and Federal design and construction standards and the level of service as presented in this AMP.

4.0 CRITICAL ASSETS

Critical assets of a system are determined based on the probability of failure and the consequence of failure of the assets. Following the "Asset Management Guidance for Wastewater and Stormwater Systems" (MDEQ), the following tables were used to determine the Probability of Failure Rating as well as the Consequence of Failure Rating.

Table 1. Probability of Failure

Description	Performance Rating	Failure of Individual Item	Type of Failure
Imminent	5	Likely to occur in the life of an item	Continuously experienced
Probable	4	Will occur several times in the life of an item	Will occur frequently
Occasional	3	Likely to occur sometime in the life of an item	Will occur a few times
Remote	2	Unlikely but possible to occur in the life of an item	Unlikely, but can reasonably be expected to occur
Improbable	1	So unlikely, it can be assumed occurrence may not be experienced	Unlikely to occur, but possible

Probability of Failure for Bergland Township assets does not take into account the current condition of an asset and will vary based on the type of asset; manholes and pipes have a low failure rate, whereas a pump would have a higher failure rate. For the purpose of this AMP, the Probability of Failure for Manholes was designated at one (1) for precast concrete manholes, two (2) for brick manholes and all pipes were designated at a one (1).

Table 2. Consequence of Failure

Description	Level	Consequence of Failure
Catastrophic disruption	5	Massive system failure, severe health effects, persistent and extensive damage
Major disruption	4	Major effect, major loss of system capacity, major health effects, major costs, important LOS compromised
Moderate disruption	3	Moderate effect, moderate loss of system capacity, moderate health effects, moderate costs, important LOS still achieved
Minor disruption	2	Minor effect, minor loss of system capacity, minor health effects, minor costs
Insignificant disruption	1	Slight effect, slight loss of system capacity, slight health effects

Consequence of Failure was determined based on location in the system and redundancy of an asset. Assets which serve more users are considered to have a higher consequence of Failure rating. Additionally, assets that do not have a duplicate are also highly critical to the proper functioning of the system.

The Criticality rating of an asset, which ranges from a low of one (1) to a high of twenty-five (25), can then be determined by multiplying the Probability of Failure (1-5) and Consequence of Failure (1-5); see Appendix B, Tables B1 through B7.

Criticality (1-25) = Probability of Failure (1-5) X Consequence of Failure (1-5)

Table 3. Business Risk

Business Risk	Numeric Range
Low Risk	1-8
Medium Risk	9-16
High Risk	>16

The Business Risk of an asset is determined by multiplying the Criticality (1-25) and the Condition (1-5) of an asset. Business Risk can range from a low of one (1) to a high of one hundred and twenty-five (125); see Appendix B, Tables B1 through B7.

Business Risk (1-125) = Criticality (1-25) X Condition (1-5)

By using the Business Risk, we are able to determine which items need to be replaced or repaired first. If multiple items have similar Business Risk ratings, the Criticality rating will determine priority.

5.0 REVENUE STRUCTURE

A Rate Methodology was performed for the Bergland Township sewer system, the purpose being to determine the viability of the current rate structure. Rates must provide adequate income to cover operation, maintenance, replacement, funding for future capital improvement projects, and debt costs. The following discusses the factors considered.

SUMMARY OF BERGLAND TOWNSHIP SANITARY SEWER SYSTEM

There are two areas that make up Bergland Township sewer collection system: the Bergland Township gravity sewer system and the Merriweather forcemain sewer system. Combined they serve approximately 354 properties from Bergland westerly to Merriweather along M-28.

The Bergland Township gravity system currently serves approximately 163 homes and businesses, which are located in the central residential area of the Township. The majority of the gravity sewer and Lagoon components are approximately forty-five years old, while there have been some minor upgrades and expansions recently installed and are approximately twenty years old. The system consists of a gravity sanitary sewer system, a lift station, a force main sanitary sewer system, and wastewater stabilization lagoons.

The Merriweather Forcemain System serves approximately 203 homes and businesses, which is located west of Bergland along M-28 and along M-64 on the west shore of Lake Gogebic, south to the Ontonagon County Park. This forcemain system is approximately five years old and is composed of a sewer forcemain, a lift station, air relief manholes and individual grinder pump stations.

BERGLAND TOWNSHIP SEWER REVENUES

Bergland Township sanitary sewer revenues consist of monies received for sewer usage. Rates for sanitary sewer services are based on the category of sewer; Residential and Commercial and the system which services are provided for the residence. There are currently different rate structures used between the Bergland Township Gravity System and the Merriweather Forcemain System. Residential and commercial services in Bergland Township are charged a fixed rate per month with no overage charges. For the Merriweather System, residential and commercial services are charged per Residential Equivalent Unit (REU). Current rates consider residential properties as one REU, whereas commercial properties range from one to eleven and one half REU's.

The current rates for the Bergland system are a fixed rate of $18.85 per residential unit and commercial users pay an increased rate ranging from $18.85 - $219.60 per month. For the Merriweather system, users are currently charged a fixed rate of $50.00 per REU. Current user rates can be found in Appendix B, Table B8 – Bergland Township Sewer Rates.

RATE COMPARISON

A review of average monthly sewer rates of surrounding communities indicates that Bergland Townships gravity sewer rates are slightly below the average rates, whereas the recently constructed Merriweather system charges are slightly above the average. Other communities used for comparison are Marenisco Township, the City of Wakefield and the City of Ironwood.

RATE ANALYSIS

Historical sanitary sewer revenues and expenses have been reviewed for the fiscal years from 2012 through 2017. Population has varied throughout the years; however, historically there were an average of 333 residentially charged users and 21 commercially charged users, with no industrial users.

Appendix B: Table B9 – Bergland Township Sanitary Sewer System Yearly Revenue illustrates Bergland Township's revenues based on user rates from 2012-Current.

Appendix B: Table B10 – Bergland Township Sanitary Sewer System Current Revenue illustrates the current sanitary sewer revenue information, which remains within the historic average of Bergland Township.

BERGLAND TOWNSHIP EXPENSES

The expenses for Bergland Township's sanitary sewer system consist of operating expenses and non-operating expenses.

Operating expenses are those directly related to the operation of the utility. These include maintenance, employee salaries, employee benefits, administrative services, financial services and professional services.

The non-operating expenses are typically expenses paid during the year for loan principals and interest payments for previous capital improvement projects or monies required to set aside for a Bond Reserve Account or Reserve, Replacement, and Improvement Fund (RRI).

A forty-year bond was issued in 2012 to help fund the construction costs for the Merriweather Forcemain System project. Current sewer rates for users of the Merriweather forcemain sewer cover the principal and interest payments for this bond. Principal payments are made annually each February, with the interest payments being paid biannually in February and August. This loan will expire in 2052, which is beyond the life of this Asset Management Plan.

A Bond Reserve Account was established in 2012. The monies in this account are used solely for the purpose of paying the principal and interest of the Bond. Payments are made into this account quarterly ($15,200 annually) until there is a balance of $93,000. This balance will be achieved in 2020. This amount will be used for the final payment of the principal and interest of the bond.

A Repair, Replacement and Improvement (RRI) Account has been established in 2012. The monies in this account are used and disbursed only for the purpose of paying the cost of repairing any damage to the system or any emergency maintenance needed for the system. Payments are made into this account quarterly, with no limit on the amount of funds this account needs to hold. A total annual amount of $24,500, less the annual amount paid into the Bond Reserve Account, are deposited into the RRI Account.

The historical cost analysis review indicates that Bergland has been operating in the positive with total yearly incomes surpassing their expenses. See Appendix B: Table B11 – Bergland Township Historical Sanitary Sewer Cost Analysis for the cost analysis of the sewer system since 2012.

Future sanitary sewer revenues and expenses have been reviewed for the fiscal year 2017 and extending out twenty years to 2038.

A system maintenance budget has previously been used and will continue to be funded out of the general sewer account. The system maintenance budget is required to monitor and upgrade the system on an as needed basis.

Assuming no growth in population, this financial projection has indicated that Bergland will continue to operate with a surplus. Additionally, the future revenue and expense review has indicated that while no rate increase is necessary, the Township may in the future want to investigate an increase based on inflation to accommodate new system repairs or maintenance and save money for future Capital Improvement Projects. See Appendix B: Table B12 – Bergland Township Future Sanitary Sewer Cost Analysis for an estimated cost analysis of the next twenty years to 2038.

6.0 SYSTEM MAINTENANCE

Collection System maintenance shall consist of jetting and vacuuming sewer mains and manholes, televising, sanitary sewer manhole repairs/reconstruction (replacing rings, grouting structures, replacing frames and covers), sanitary sewer manhole replacement, and pipe repair/replacement.

Lift Station system maintenance shall consist of monitoring the components and controls of the lift station, jetting and vacuuming, and valve and meter repair.

Wastewater Stabilization Lagoons system maintenance shall consist of monitoring the components of the Wastewater Stabilization Lagoons, jetting and vacuuming, and valve repair.

System maintenance will be funded by using the general sewer fund as it has been in the past. System maintenance and repairs will typically focus on assets in need of repair on an as needed basis and/or assets with a high business risk or criticality. A total annual budget of approximately $20,000 has been used in the past for system maintenance. This budget will be included for future system maintenance needs.

System maintenance and replacement shall be performed by the designated action in the designated maintenance year as set for in Tables B1 through B7 of Appendix B. Focus is concentrated on assets with a high business risk and criticality.

General costs of System Maintenance were estimated as follows:

Gravity Pipe or Forcemain:

$125-250 per foot of pipe for replacement depending on depth (includes cost of road rebuild)

$5,000 for each repair/spot liner

$1,000 each occurrence for routine maintenance

Manholes:

$350 per foot of depth for manhole replacement

$2,000 for each major repair

$1,500 for each moderate repair

$1,000 for each minor repair

$500 each occurrence for routine maintenance

Costs for lift Stations components and the wastewater stabilization lagoons components were determined by the need for routine maintenance, repair, or replacement of the component and the cost of the asset itself.

7.0 CAPITAL IMPROVEMENT PROJECT PLAN

At the current time, there is no indication of system expansion or growth expected for the Township for new housing or business that does not currently exist; therefore, no major Capital Improvement Projects are proposed at this time. In the foreseeable future, the Bergland Townships main goal is to find a way to expand the Merriweather system along the west shore of Lake Gogebic in order to improve water quality in Lake Gogebic. See Appendix E regarding the LGASA PER and funding application. Not listed in this Capital Improvements Plan, is the option of Bergland Township doing a Merrieweather extension project on the west side of Lake Gogebic, by themselves, without Marenisco Township's involvement under "LGASA". This option is included as an option within Appendix E, if the Township elects to do a smaller project not crossing over the County line.

This AMP is forecasting projects for a duration of twenty years; the remaining life of many of the system's components extend beyond this time period. Assets that will not last throughout this period are covered in the System Maintenance Budget category and will be repaired, replaced, or have routine maintenance performed as shown in Appendix B - Tables B1 through B7.

The Township has created a Repair, Replacement and Improvement (RRI) Account, which began in 2012. The monies in this account are used and disbursed only for the sole purpose of paying the maintenance and repair costs needed to maintain the system or any emergency maintenance needed to keep the system functioning properly. These funds can also be used to help fund any future Capital Improvement Projects in the Township.

As previously stated, the Township does not plan to perform any Capital Improvement Projects within the next twenty years, however, potential projects have been identified should the need arise or funding become available. Timelines for these projects have yet to be defined. The following summarizes some of the potential projects.

Project Title: Gravity Sewer System Repairs

Description: Sanitary sewer main spot repairs of broken pipe, infiltations, and other defects at locations throughout the township. This work could be worked on annually little by little, using maintenance funds, or grouped together into a larger project.

Justification: Televising reports show a number of broken sections of the sewer main. Replacement of these sections will allow for a more efficient gravity system.

Item	Estimated Current Year Project Cost
Engineering, Legal, Testing	$ 100,000.00
Construction	$ 500,000.00
Total	**$ 600,000.00**

Effect on Future Operating Costs: Reduction in operation and maintenance costs.

Possible Alternative if Project is Not Funded in Scheduled Year: None

Consequence of Project not being Constructed in Scheduled Year: Gradual decline in gravity sewer system operation.

Project Title: Gravity Sanitary Sewer Manhole Repairs

Description: Grout approximately 25 manholes throughout the township.

Justification: The manholes slighted for this project are in poor condition and allow for infiltration.

Costs:

Item	Estimated Current Year Project Cost
Engineering, Legal, Testing	$ 12,000.00
Construction	$ 50,000.00
Total	**$ 62,000.00**

Effect on Future Operating Costs: Reduction in operation and maintenance costs.

Possible Alternative if Project is Not Funded in Scheduled Year: None

Consequence of Project not being Constructed in Scheduled Year: Gradual decline in gravity sewer system operation.

Project Title: Wastewater Stabilization Lagoons Dredging

Description: Removal and disposal of excess sludge accumulation in the Township's Wastewater Stabilization Lagoons.

Justification: Removal of excess sludge to increase its storage capacity and increase efficiency.

Costs:

Item	Estimated Current Year Project Cost
Engineering, Legal, Testing	$ 120,000.00
Construction	$ 1,200,000.00
Total	**$ 1,320,000.00**

Effect on Future Operating Costs: Reduction in operation and maintenance costs.

Possible Alternative if Project is Not Funded in Scheduled Year: None

Consequence of Project not being Constructed in Scheduled Year: Gradual decline in lagoon system operation.

Project Title: Wastewater Stabilization Lagoons Repairs

Description: Remove and replace outlet piping, discharge and inlet structures, valves and piping and relocate eastern fence line.

Justification: Replacing aging Wastewater Stabilization Lagoon components to increase efficiency.

Item	**Estimated Current Year Project Cost**
Engineering, Legal, Testing	$ 60,000.00
Construction	$ 305,000.00
Total	**$ 365,000.00**

Effect on Future Operating Costs: Reduction in operation and maintenance costs.

Possible Alternative if Project is Not Funded in Scheduled Year: None

Consequence of Project not being Constructed in Scheduled Year: Gradual decline in lagoon system operation.

8.0 LAKE GOGEBIC AREA SEWER AUTHORITY (LGASA)

LGASA is the recently formed sewer authority for the Lake Gogebic area, combining Bergland Township and Marenisco Township to form an authority for any future sewer projects along Lake Gogebic in either adjoining township. LGASA will serve as a separate sewage service district and will be funded separately from the existing Bergland Township Sewer System.

A Preliminary Engineering Report has been prepared on behalf of LGASA to evaluate the possibility of receiving funding for the construction of a new sanitary sewer system to serve the west shore of Lake Gogebic. This project would be a Phase I sewer construction project for LGASA. The project would service approximately 7.8 miles of residential area along M-64, from the Ontonagon County Park at the southern limits of Bergland Township's Merriweather system (approximately 2.2 miles south of M-28) to approximately 10.0 miles south of M-28. The estimated cost of this Phase I project is approximately $11 million.

See Appendix E – LGASA Phase I USDA Funding Application and PER for more info on LGASA.

9.0 CONCLUSIONS

A very small percentage of the system contains asset components that are considered high business risk, with the majority of the system in the medium risk category. Approximately 17% of the system is considered low business risk and 79% of the system is considered medium risk and 4% is considered high business risk. These numbers were calculated using the total dollar value of each risk category compared to the the total dollar value of the system.

The Townships cash flow at the beginning of the asset management analysis showed that total expenses and total income balance each other out. Since construction of the Merriweather Forcemain system in 2012, the sewer rates have increased twice for each the gravity sewer users and the forcemain sewer users, with the more noticeable changes occurring for the Merriweather system users. A long-term goal for Bergland Township should be to combine the Merriweather forcemain users and the Bergland gravity sewer users into one rate structure that could cover the expenses of Bergland Township's sewer system.

The change in rate structure provides a more stable income for the Township without major rate changes in the future. The change in rate structure also provides possibilities for money to be set aside for future projects. While it is not possible to set aside the total amount of money required for projects in the near future, it does make it possible for money to be set aside for major projects in the 15 to 20 year range.

The Township currently has a surplus of funds in the general sewer account of approximately $300,000. With the current sewer rates remaining constant this surplus should remain constant or slightly increase annually, leaving the Township with additional money for maintenance, repairs or future projects to upgrade any sewer assets in need of service.

With the changes incorporated in the asset management plan, and with scheduled yearly review and revision of the asset management plan, the future financial condition will ensure long-term stability of the Township.

10.0 GUIDE TO ASSET MANAGEMENT PLAN (AMP) UPDATES

Future system maintenance and capital improvement projects will improve the failing components of the system thus changing the AMP Summary Tables. Upon completion of such work, these tables shall be updated to represent the current situation of Bergland Township's sewer system. The following is a guide of how to maintain the summary tables.

System Maintenance Updates

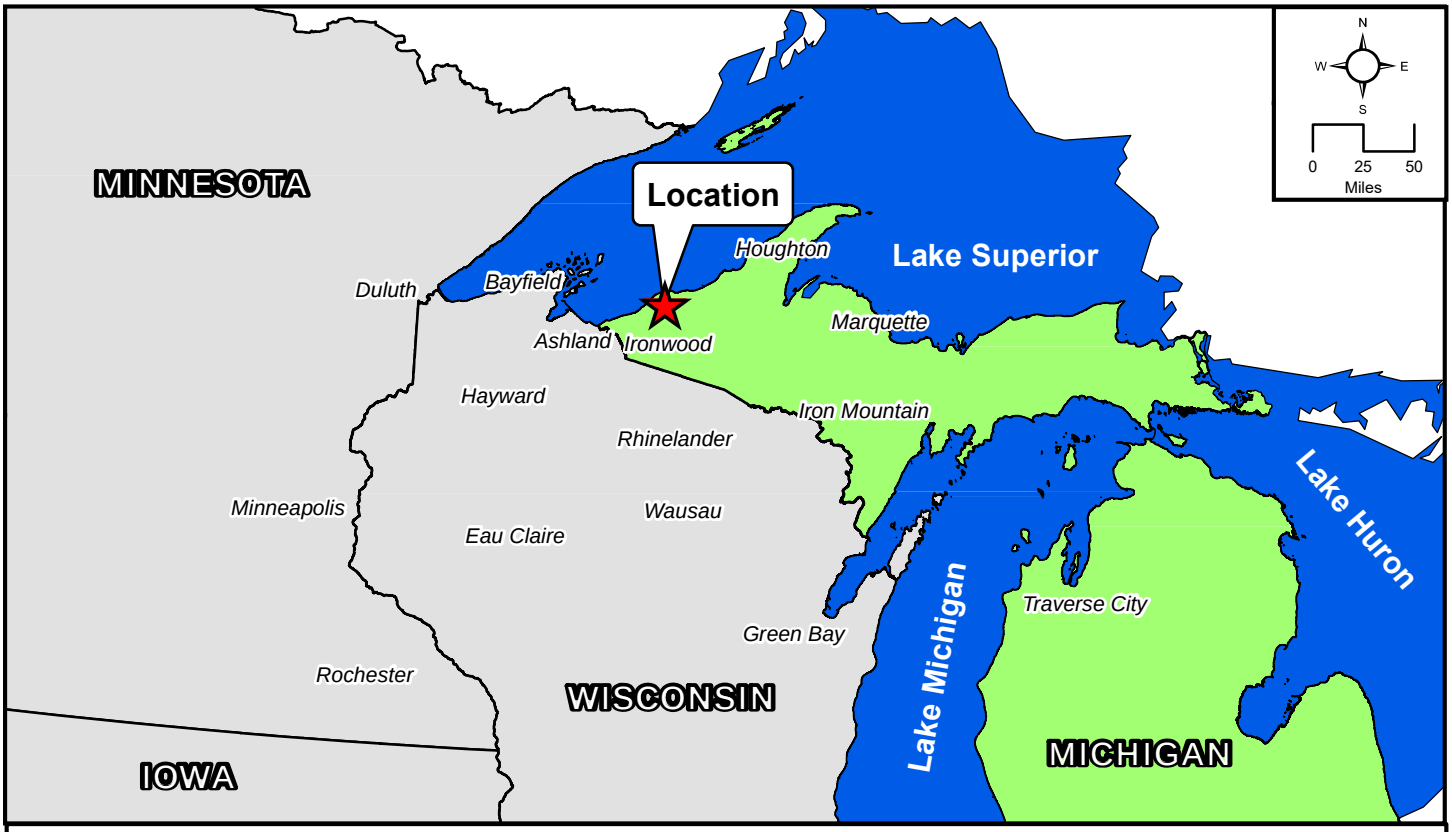
1. Locate asset in summary table.
2. Update replaced/repaired item details (size, material, length, depth, etc.)
3. Update Year Installed to current year.
4. Condition – Rating 1 through 5, with 1 being Good Condition and 5 being Poor Condition.
5. The remainder of the columns will be updated automatically.

Capital Improvement Updates

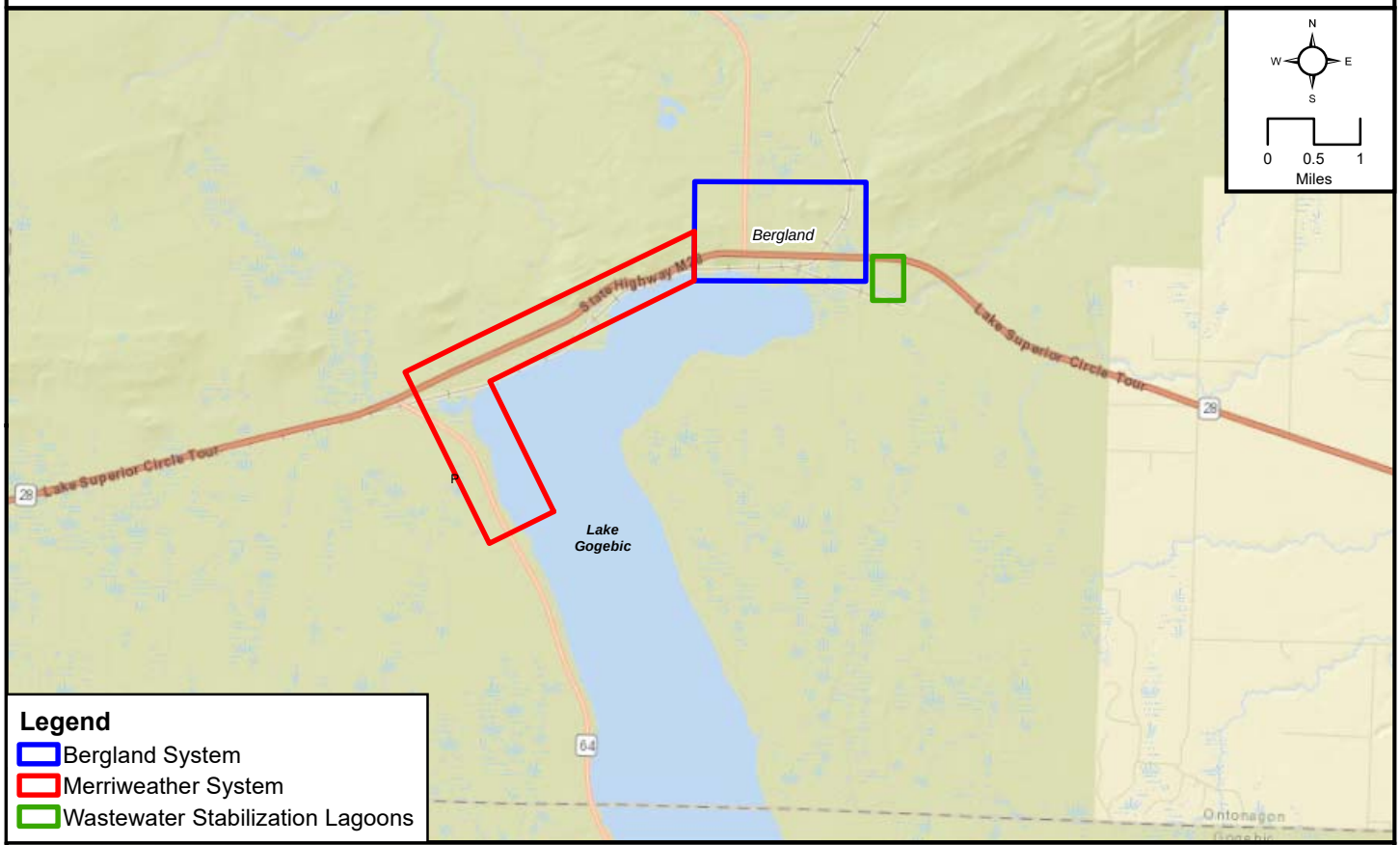
1. Locate asset in summary table.
2. Update item details (size, material, length, depth, etc.), remove from table if item has been taken out of system, or add new items to the table.
3. Update Year Installed to current year.
4. Condition – Rating 1 through 5, with 1 being Good Condition and 5 being Poor Condition.
5. The remainder of the columns will be updated automatically.

APPENDIX A

FIGURES



LOCATION MAP

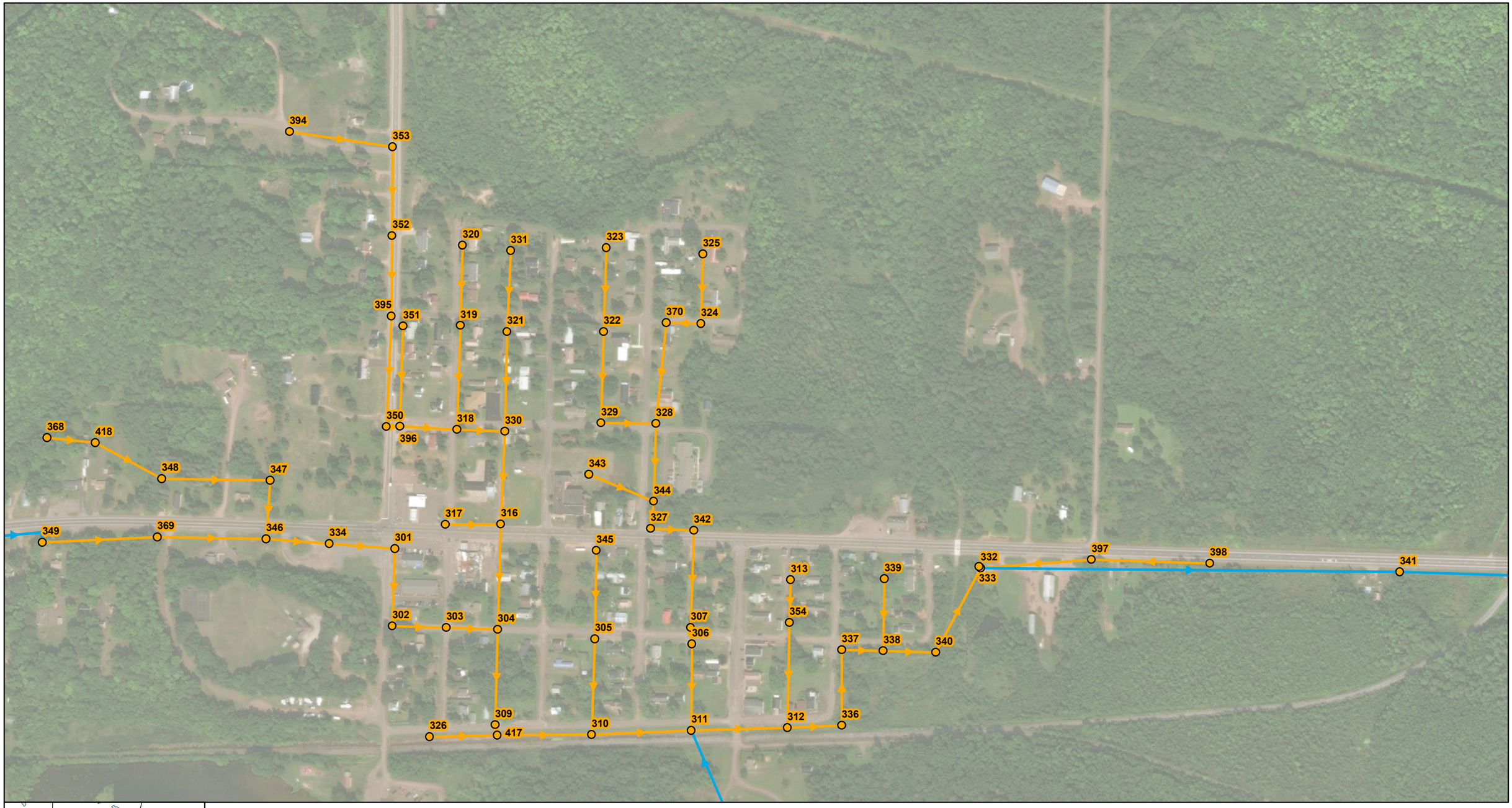


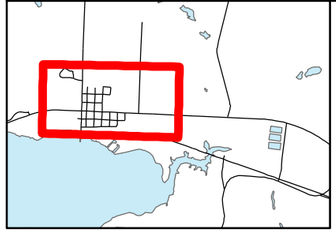
SYSTEM LIMITS MAP

COLEMAN ENGINEERING COMPANY
IRON MOUNTAIN • IRONWOOD • NEGAUNEE • GREEN BAY
www.coleman-engineering.com

BERGLAND TOWNSHIP ASSET MANAGEMENT PLAN
Sanitary Sewer System
Location Map
Gogebic County & Ontonagon County, Michigan

Project No:	Drawn By:
15440	KGR
Map Date:	Figure No:
Nov 09, 2018	1





Gravity Manhole

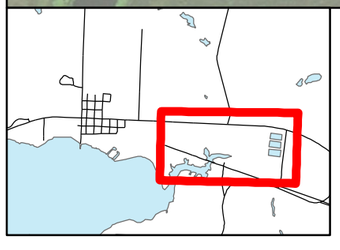
Gravity Sewer Main

Forcemain Sewer

Figure A2 - Bergland Township Sanitary Sewer System

1 inch = 350 feet

N W E S



Gravity Manhole

Gravity Sewer Main

Forcemain Sewer

Figure A3 - Bergland Township Sanitary Sewer System

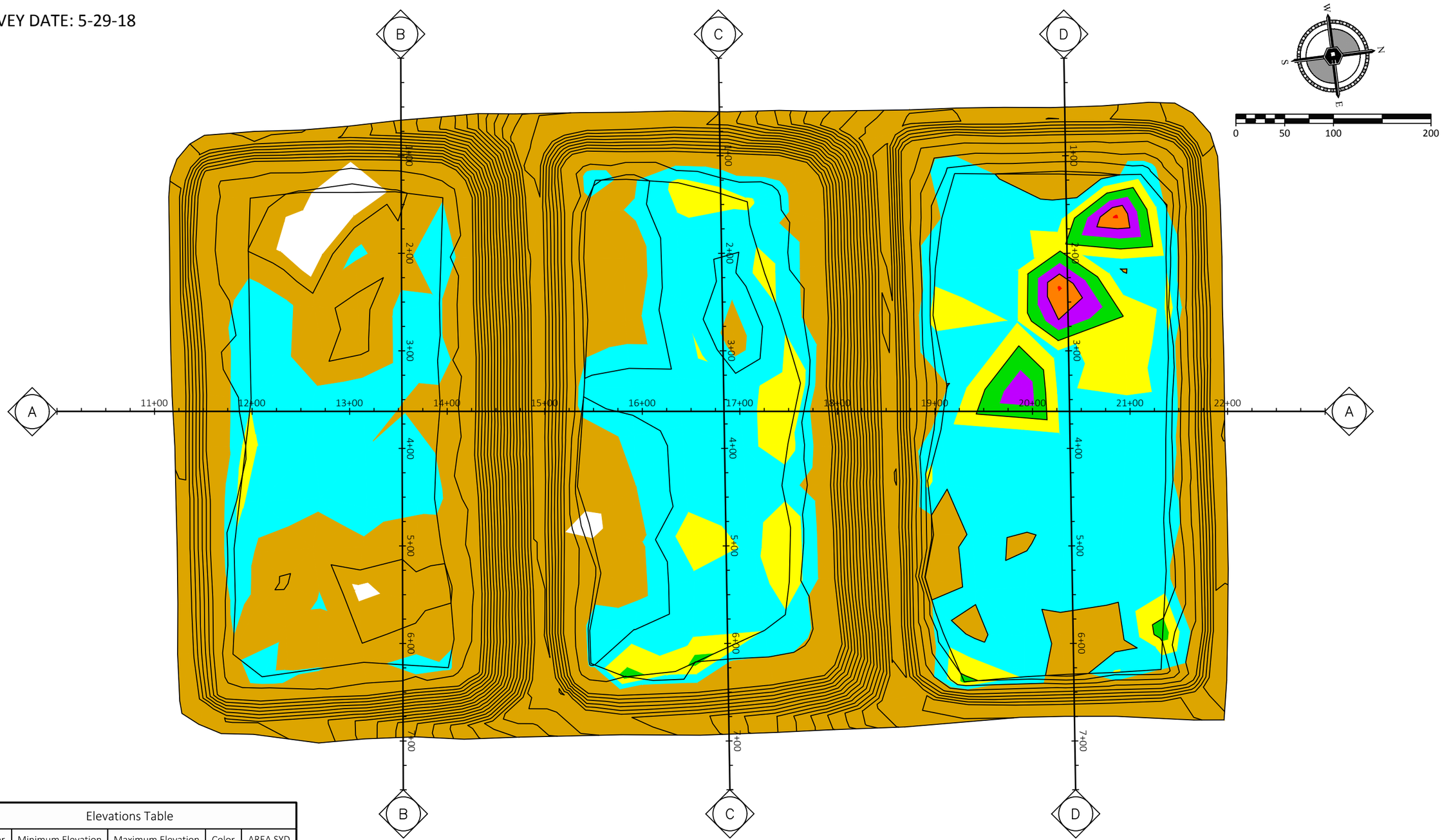
1 inch = 350 feet

N

W E

S

SURVEY DATE: 5-29-18



Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Color	AREA SYD
1	-3.500	-3.000		4.02
2	-3.000	-2.500		168.32
3	-2.500	-2.000		468.23
4	-2.000	-1.500		894.61
5	-1.500	-1.000		4357.78
6	-1.000	-0.500		23755.67
7	-0.500	0.000		20729.95

APPROXIMATE SLUDGE VOLUME: 10,082 CY

COLEMAN ENGINEERING COMPANY
IRON MOUNTAIN • IRONWOOD • NEGAUNEE • GREEN BAY
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SHEET NAME: EXISTING SITE TOPOLOGY

PROJECT: LAGOON TOPOLOGY BERGLAND TOWNSHIP

CAD DRAWING: 15440-PP

CAD PROJECT: CAD15440

DRAWN BY: Mark Surprenant

CHECKED BY: PCA

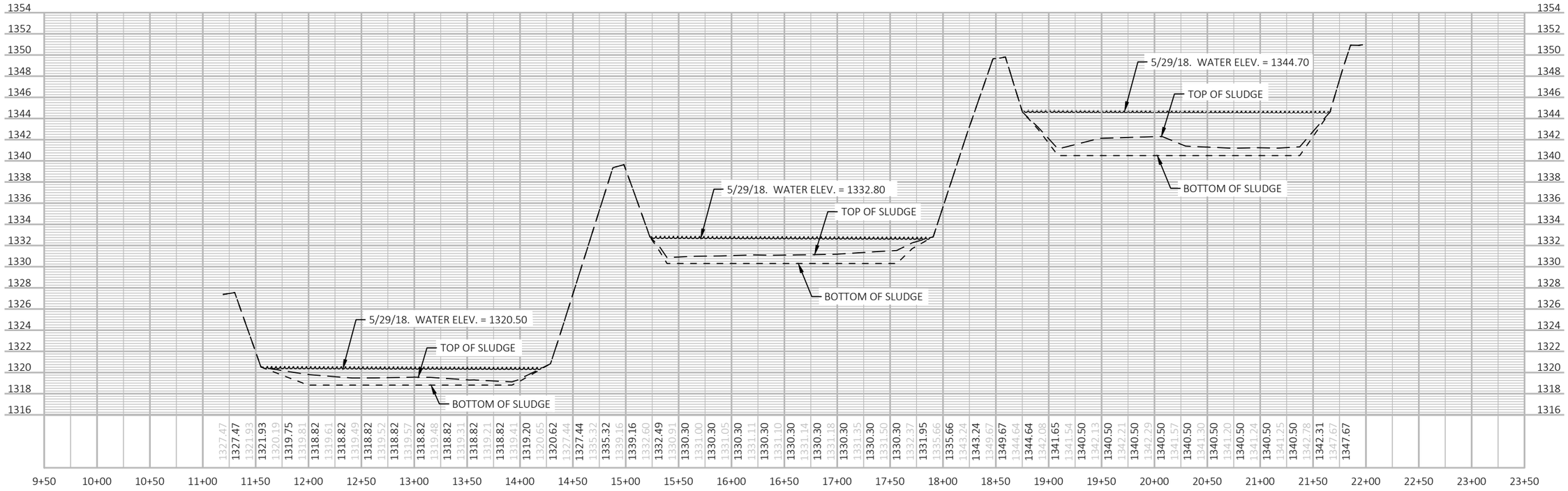
SURVEYED BY: CEC

DATE: 6/7/18

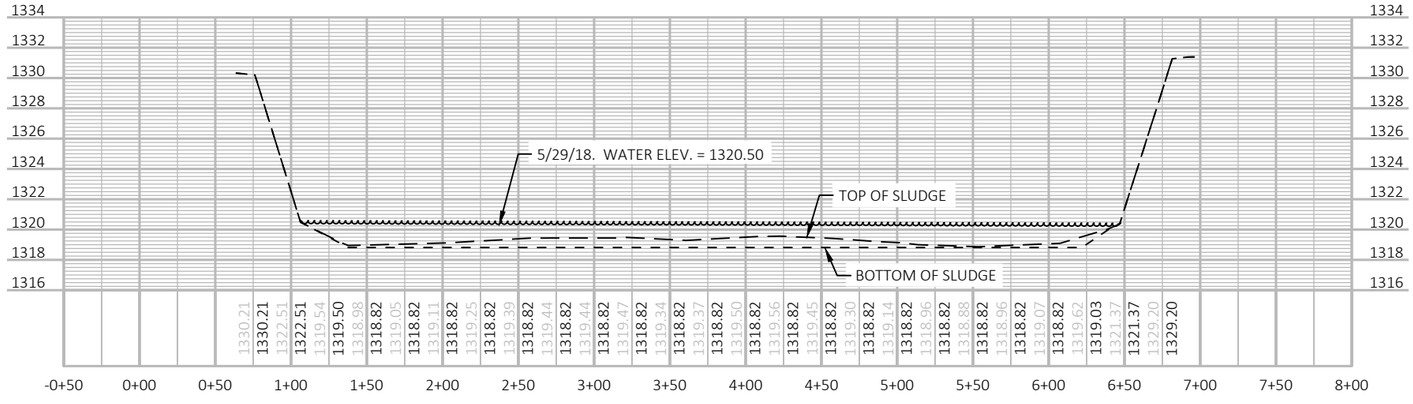
A4.1

DRAWING NO.

Profile View of Section A-A
V Scale : 4
H Scale : 40
Exaggeration : 10



Profile View of Section B-B
V Scale : 4
H Scale : 40
Exaggeration : 10



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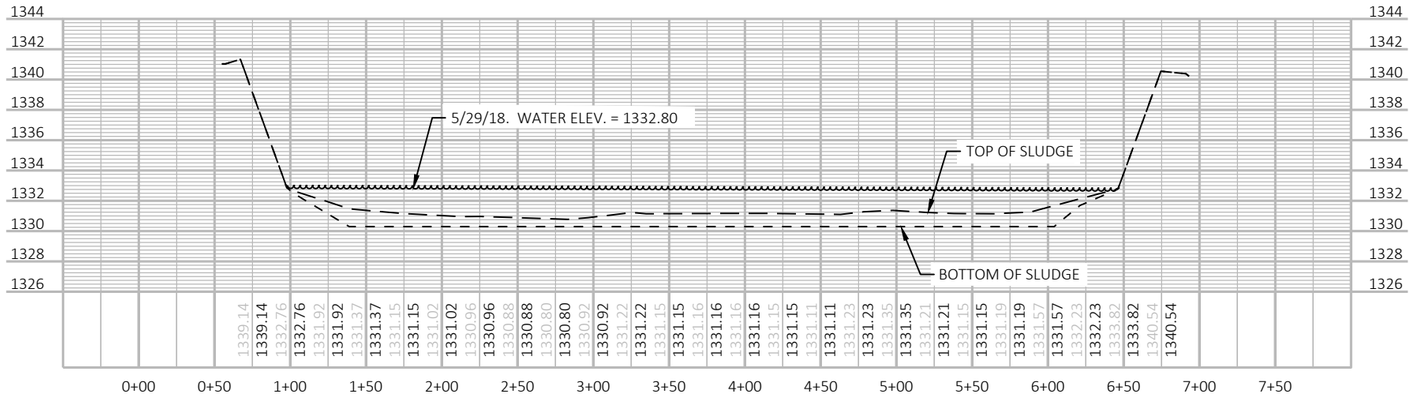
SHEET NAME: LAGOON POND SECTIONS

PROJECT: LAGOON TOPOLOGY BERGLAND TOWNSHIP

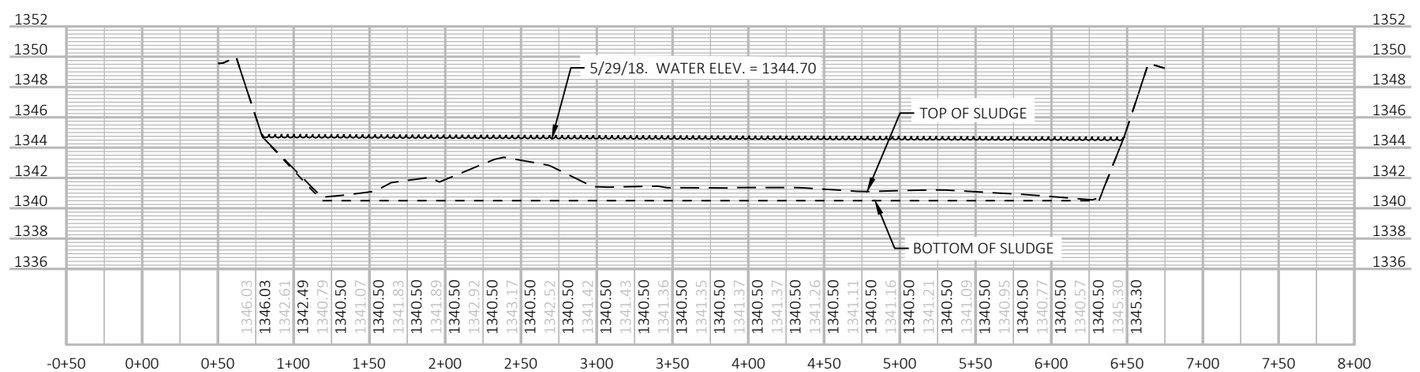
CAD DRAWING: 15440-PP
CAD PROJECT: CAD15440
SURVEYED BY: CEC
DRAWN BY: Mark Surprenant
CHECKED BY: PCA
DATE: 6/7/18

A4.2
DRAWING NO.

Profile View of Section C-C
V Scale : 4
H Scale : 40
Exaggeration : 10



Profile View of Section D-D
V Scale : 4
H Scale : 40
Exaggeration : 10



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SHEET NAME: LAGOON POND SECTIONS

PROJECT: LAGOON TOPOLOGY BERGLAND TOWNSHIP

CAD DRAWING: 15440-PP
CAD PROJECT: CAD15440
DRAWN BY: Mark Surprenant
CHECKED BY: PCA
SURVEYED BY: CEC
DATE: 6/7/18

A4.3
DRAWING NO.

APPENDIX B

TABLES

Table B1: Sanitary Sewer Gravity Pipe Summary

Upstream Manhole	Downstream Manhole	Pipe Size	Pipe Material	Length (ft)	Approximate Depth (ft)	Year Installed	Cost Per Linear Foot	Lifespan	Replacement Cost	Remaining Useful Life in Years	Condition	Probability of Failure	Consequence of Failure	Criticality	Business Risk	Action	Televising Cost	Maintenance Cost	Maintenance Year
316	304	8	RPM Truss	395	8.8	1971	$ 125	100	$ 49,375	53	4	1	4	4	16	Repair	$ -	$ 5,000.00	2019
327	342	8	RPM Truss	153	9	1971	$ 125	100	$ 19,125	53	4	1	4	4	16	Routine Maintenance	$ -	$ 1,000.00	2020
342	307	8	RPM Truss	362	7.9	1971	$ 125	100	$ 45,250	53	4	1	4	4	16	Routine Maintenance	$ -	$ 1,000.00	2020
301	302	8	RPM Truss	289	10.5	1971	$ 156	100	$ 45,156	53	3	1	5	5	15	Televise/Routine Maintenance	$ 800.00	$ 1,000.00	2020
302	303	8	RPM Truss	199	9	1971	$ 125	100	$ 24,875	53	3	1	5	5	15	Televise/Routine Maintenance	$ 500.00	$ 1,000.00	2020
303	304	8	RPM Truss	191	8.9	1971	$ 125	100	$ 23,875	53	3	1	5	5	15	Televise/Routine Maintenance	$ 500.00	$ 1,000.00	2020
304	309	8	RPM Truss	357	8.9	1971	$ 125	100	$ 44,625	53	3	1	5	5	15	Routine Maintenance	$ -	$ 1,000.00	2021
310	311	8	RPM Truss	371	8.1	1971	$ 125	100	$ 46,375	53	3	1	5	5	15	Televise/Routine Maintenance	$ 1,000.00	$ 1,000.00	2021
311	312	8	RPM Truss	359	8.9	1971	$ 125	100	$ 44,875	53	3	1	5	5	15	Televise/Routine Maintenance	$ 900.00	$ 1,000.00	2021
312	336	8	RPM Truss	202	8.9	1971	$ 125	100	$ 25,250	53	3	1	5	5	15	Televise/Routine Maintenance	$ 600.00	$ 1,000.00	2021
334	301	8	RPM Truss	245	10.5	1971	$ 156	100	$ 38,281	53	3	1	5	5	15	Televise/Routine Maintenance	$ 700.00	$ 1,000.00	2021
336	337	8	RPM Truss	282	11.1	1971	$ 156	100	$ 44,063	53	3	1	5	5	15	Televise/Routine Maintenance	$ 800.00	$ 1,000.00	2022
337	338	8	RPM Truss	156	11.1	1971	$ 156	100	$ 24,375	53	3	1	5	5	15	Televise/Routine Maintenance	$ 400.00	$ 1,000.00	2022
338	340	8	RPM Truss	195	8.1	1971	$ 125	100	$ 24,375	53	3	1	5	5	15	Televise/Routine Maintenance	$ 500.00	$ 1,000.00	2022
340	333	8	RPM Truss	358	11.5	1971	$ 156	100	$ 55,938	53	3	1	5	5	15	Televise/Routine Maintenance	$ 900.00	$ 1,000.00	2022
346	334	8	RPM Truss	238	11	1971	$ 156	100	$ 37,188	53	3	1	5	5	15	Televise/Routine Maintenance	$ 600.00	$ 1,000.00	2022
349	369	8	RPM Truss	428	15.7	1971	$ 188	100	$ 80,250	53	3	1	5	5	15	Televise/Routine Maintenance	$ 1,100.00	$ 1,000.00	2023
369	346	8	RPM Truss	409	15.7	1971	$ 188	100	$ 76,688	53	3	1	5	5	15	Televise/Routine Maintenance	$ 1,100.00	$ 1,000.00	2023
417	310	8	RPM Truss	352	5.7	1971	$ 125	100	$ 44,000	53	3	1	5	5	15	Televise/Routine Maintenance	$ 900.00	$ 1,000.00	2023
306	311	8	RPM Truss	322	8.1	1971	$ 125	100	$ 40,250	53	3	1	4	4	12	Routine Maintenance	$ -	$ 1,000.00	2023
307	306	8	RPM Truss	60	7.4	1971	$ 125	100	$ 7,500	53	3	1	4	4	12	Routine Maintenance	$ -	$ 1,000.00	2023
329	328	8	RPM Truss	204	8	1971	$ 125	100	$ 25,500	53	4	1	3	3	12	Routine Maintenance	$ -	$ 1,000.00	2024
370	328	8	RPM Truss	379	20.5	1971	$ 250	100	$ 94,750	53	4	1	3	3	12	Repair	$ -	$ 5,000.00	2025
328	344	8	RPM Truss	291	5	1971	$ 125	100	$ 36,375	53	4	1	3	3	12	Repair	$ -	$ 5,000.00	2026
309	417	8	RPM Truss	38	5.7	1971	$ 125	100	$ 4,750	53	2	1	5	5	10	No Action Required	$ -	$ -	-
305	310	8	RPM Truss	355	7.5	1971	$ 125	100	$ 44,375	53	3	1	3	3	9	Televise/Routine Maintenance	$ 900.00	$ 1,000.00	2024
313	354	8	RPM Truss	160	15	1971	$ 156	100	$ 25,000	53	3	1	3	3	9	Televise/Routine Maintenance	$ 400.00	$ 1,000.00	2024
317	316	8	RPM Truss	208	8.8	1971	$ 125	100	$ 26,000	53	3	1	3	3	9	Routine Maintenance	$ -	$ 1,000.00	2024
318	330	8	RPM Truss	181	14.3	1971	$ 156	100	$ 28,281	53	3	1	3	3	9	Routine Maintenance	$ -	$ 1,000.00	2024
321	330	8	RPM Truss	372	14.3	1971	$ 156	100	$ 58,125	53	3	1	3	3	9	Routine Maintenance	$ -	$ 1,000.00	2027
322	329	8	RPM Truss	342	8	1971	$ 125	100	$ 42,750	53	3	1	3	3	9	Routine Maintenance	$ -	$ 1,000.00	2027
347	346	8	RPM Truss	220	11	1971	$ 156	100	$ 34,375	53	3	1	3	3	9	Televise/Routine Maintenance	$ 600.00	$ 1,000.00	2027
348	347	8	RPM Truss	405	12	1971	$ 156	100	$ 63,281	53	3	1	3	3	9	Televise/Routine Maintenance	$ 1,100.00	$ 1,000.00	2027
350	396	8	RPM Truss	47	4.9	1971	$ 125	100	$ 5,875	53	3	1	3	3	9	Routine Maintenance	$ -	$ 1,000.00	2027
395	350	8	RPM Truss	415	9.3	1971	$ 125	100	$ 51,875	53	3	1	3	3	9	Repair	$ -	$ 5,000.00	2028
354	312	8	RPM Truss	390	9.3	1971	$ 125	100	$ 48,750	53	3	1	3	3	9	Televise/Routine Maintenance	$ 1,000.00	$ 1,000.00	2029
325	324	8	RPM Truss	258	9.8	1971	$ 125	100	$ 32,250	53	4	1	2	2	8	Routine Maintenance	$ -	$ 1,000.00	2029
343	344	8	RPM Truss	224	14.3	1971	$ 156	100	$ 35,000	53	4	1	2	2	8	Routine Maintenance	$ -	$ 1,000.00	2029
330	316	8	RPM Truss	348	14.3	1971	$ 156	100	$ 54,375	53	2	1	3	3	6	Routine Maintenance	$ -	$ 1,000.00	2029
331	321	8	RPM Truss	305	9.3	1971	$ 125	100	$ 38,125	53	3	1	2	2	6	Routine Maintenance	$ -	$ 1,000.00	2029
320	319	8	RPM Truss	302	10.1	1971	$ 156	100	$ 47,188	53	3	1	2	2	6	Routine Maintenance	$ -	$ 1,000.00	2030
323	322	8	RPM Truss	311	9.1	1971	$ 125	100	$ 38,875	53	3	1	2	2	6	Routine Maintenance	$ -	$ 1,000.00	2030
324	370	8	RPM Truss	129	20.5	1971	$ 250	100	$ 32,250	53	3	1	2	2	6	Routine Maintenance	$ -	$ 1,000.00	2030
326	417	8	RPM Truss	252	5.7	1971	$ 125	100	$ 31,500	53	3	1	2	2	6	Televise/Routine Maintenance	$ 700.00	$ 1,000.00	2030
339	338	8	RPM Truss	269	10.5	1971	$ 156	100	$ 42,031	53	3	1	2	2	6	Televise/Routine Maintenance	$ 700.00	$ 1,000.00	2030
345	305	8	RPM Truss	331	7.5	1971	$ 125	100	$ 41,375	53	3	1	2	2	6	Televise/Routine Maintenance	$ 900.00	$ 1,000.00	2031
351	396	8	RPM Truss	377	8.8	1971	$ 125	100	$ 47,125	53	3	1	2	2	6	Routine Maintenance	$ -	$ 1,000.00	2031
368	418	8	RPM Truss	183	12.5	1971	$ 156	100	$ 28,594	53	3	1	2	2	6	Televise/Routine Maintenance	$ 500.00	$ 1,000.00	2031
394	353	8	PVC	399	9.1	2000	$ 125	100	$ 49,875	82	3	1	2	2	6	Routine Maintenance	$ -	$ 1,000.00	2031
397	333	8	RPM Truss	420	11.3	1971	$ 156	100	$ 65,625	53	3	1	2	2	6	Televise/Routine Maintenance	$ 1,100.00	$ 1,000.00	2031
319	318	8	RPM Truss	390	12.6	1971	$ 156	100	$ 60,938	53	2	1	3	3	6	Televise/Routine Maintenance	$ 1,000.00	$ 1,000.00	2032
398	397	8	RPM Truss	442	11.3	1971	$ 156	100	$ 69,063	53	3	1	2	2	6	Televise/Routine Maintenance	$ 1,200.00	$ 1,000.00	2032
418	348	8	RPM Truss	280	12.5	1971	$ 156	100	$ 43,750	53	3	1	2	2	6	Televise/Routine Maintenance	$ 700.00	$ 1,000.00	2032
344	327	8	RPM Truss	103	9	1971	$ 125	100	$ 12,875	53	2	1	3	3	6	No Action Required	$ -	$ -	-
352	395	8	RPM Truss	300	9.5	1971	$ 125	100	$ 37,500	53	2	1	3	3	6	No Action Required	$ -	$ -	-
353	352	8	RPM Truss	332	9.5	1971	$ 125	100	$ 41,500	53	2	1	3	3	6	No Action Required	$ -	$ -	-
396	318	8	RPM Truss	214	12.6	1971	$ 156	100	$ 33,438	53	2	1	3	3	6	No Action Required	$ -	$ -	-
																TOTAL =	**$ 22,100.00**	**$ 68,000.00**	

Table B2: Sanitary Sewer Gravity Manhole Summary

Manhole	Diameter* (in)	Material	Depth (ft)	Year Installed	Replacement Cost	Remaining Useful Life in Years	Condition	Probability of Failure	Consequence of Failure	Criticality	Business Risk	Action	Maintenance Cost	Maintenance Year
303	48	Precast	7.19	1971	$ 2,800.00	53	4	1	5	5	20	Moderate Repairs	$ 1,500.00	2019
304	48	Precast	8.87	1971	$ 3,150.00	53	4	1	5	5	20	Minor Repairs	$ 1,000.00	2019
311	48	Precast	8.11	1971	$ 3,150.00	53	4	1	5	5	20	Minor Repairs	$ 1,000.00	2020
337	48	Precast	11.08	1971	$ 4,200.00	53	4	1	5	5	20	Minor Repairs	$ 1,000.00	2020
301	48	Precast	10.5	1971	$ 3,850.00	53	3	1	5	5	15	Routine Maintenance	$ 500.00	2019
309	48	Precast	4.5	1971	$ 1,750.00	53	3	1	5	5	15	Minor Repairs	$ 1,000.00	2020
346	48	Precast	10.95	1971	$ 3,850.00	53	3	1	5	5	15	Minor Repairs	$ 1,000.00	2020
369	48	Precast	15.7	1971	$ 5,600.00	53	3	1	5	5	15	Minor Repairs	$ 1,000.00	2020
302	48	Precast	9	1971	$ 3,150.00	53	3	1	5	5	15	Routine Maintenance	$ 500.00	2021
312	48	Precast	8.92	1971	$ 3,150.00	53	3	1	5	5	15	Routine Maintenance	$ 500.00	2021
334	48	Precast	7.8	1971	$ 2,800.00	53	3	1	5	5	15	Routine Maintenance	$ 500.00	2021
336	48	Precast	7.59	1971	$ 2,800.00	53	3	1	5	5	15	Routine Maintenance	$ 500.00	2021
338	48	Precast	7.65	1971	$ 2,800.00	53	3	1	5	5	15	Minor Repairs	$ 1,000.00	2021
340	48	Precast	8.1	1971	$ 3,150.00	53	3	1	5	5	15	Minor Repairs	$ 1,000.00	2021
417	48	Precast	5.74	1971	$ 2,100.00	53	3	1	5	5	15	Routine Maintenance	$ 500.00	2021
306	48	Precast	6.5	1971	$ 2,450.00	53	3	1	4	4	12	Routine Maintenance	$ 500.00	2021
305	48	Precast	7.51	1971	$ 2,800.00	53	4	1	3	3	12	Moderate Repairs	$ 1,500.00	2022
307	48	Precast	7.44	1971	$ 2,800.00	53	3	1	4	4	12	Moderate Repairs	$ 1,500.00	2022
318	48	Precast	12.6	1971	$ 4,550.00	53	3	1	4	4	12	Routine Maintenance	$ 500.00	2022
342	48	Precast	7.85	1971	$ 2,800.00	53	3	1	4	4	12	Routine Maintenance	$ 500.00	2022
344	48	Precast	5	1971	$ 1,750.00	53	4	1	3	3	12	Minor Repairs	$ 1,000.00	2022
333	48	Precast	19	1971	$ 6,650.00	53	2	1	5	5	10	Routine Maintenance	$ 500.00	2023
349	48	Precast	9.31	1971	$ 3,500.00	53	2	1	5	5	10	Routine Maintenance	$ 500.00	2023
397	48	Precast	10.6	1971	$ 3,850.00	53	5	1	2	2	10	Moderate Repairs	$ 1,500.00	2023
398	48	Precast	8	1971	$ 2,800.00	53	5	1	2	2	10	Moderate Repairs	$ 1,500.00	2023
310	48	Precast	5.62	1971	$ 2,100.00	53	2	1	5	5	10	No Action Required	$ -	-
327	48	Precast	9	1971	$ 3,150.00	53	3	1	3	3	9	Minor Repairs	$ 1,000.00	2023
328	48	Precast	3.7	1971	$ 1,400.00	53	3	1	3	3	9	Routine Maintenance	$ 500.00	2024
329	48	Precast	8	1971	$ 2,800.00	53	3	1	3	3	9	Routine Maintenance	$ 500.00	2024
339	48	Precast	10.49	1971	$ 3,850.00	53	3	1	3	3	9	Minor Repairs	$ 1,000.00	2024
347	48	Precast	5.6	1971	$ 2,100.00	53	3	1	3	3	9	Minor Repairs	$ 1,000.00	2024
348	48	Precast	12.04	1971	$ 4,550.00	53	3	1	3	3	9	Routine Maintenance	$ 500.00	2024
353	48	Precast	9.09	1971	$ 3,500.00	53	3	1	3	3	9	Routine Maintenance	$ 500.00	2024
370	48	Precast	20.5	1971	$ 7,350.00	53	3	1	3	3	9	Minor Repairs	$ 1,000.00	2024
354	48	Precast	9.27	1971	$ 3,500.00	53	3	1	3	3	9	Routine Maintenance	$ 500.00	2025
394	48	Precast	8.9	1985	$ 3,150.00	67	3	1	3	3	9	Routine Maintenance	$ 500.00	2025
418	48	Precast	12.5	1971	$ 4,550.00	53	3	1	3	3	9	Routine Maintenance	$ 500.00	2025
330	48	Precast	14.25	1971	$ 5,250.00	53	2	1	4	4	8	No Action Required	$ -	-
316	48	Precast	8.84	1971	$ 3,150.00	53	3	1	2	2	6	Minor Repairs	$ 1,000.00	2025
317	48	Precast	6.75	1971	$ 2,450.00	53	3	1	2	2	6	Routine Maintenance	$ 500.00	2025
319	48	Precast	10.09	1971	$ 3,850.00	53	3	1	2	2	6	Minor Repairs	$ 1,000.00	2025
321	48	Precast	9.3	1971	$ 3,500.00	53	3	1	2	2	6	Minor Repairs	$ 1,000.00	2025
322	48	Precast	6.4	1971	$ 2,450.00	53	3	1	2	2	6	Minor Repairs	$ 1,000.00	2026
324	48	Precast	9.8	1971	$ 3,500.00	53	3	1	2	2	6	Routine Maintenance	$ 500.00	2026
343	48	Precast	14.25	1971	$ 5,250.00	53	3	1	2	2	6	No Action Required	$ -	-
350	48	Precast	4.39	1971	$ 1,750.00	53	2	1	3	3	6	No Action Required	$ -	-
352	48	Precast	9.48	1971	$ 3,500.00	53	2	1	3	3	6	No Action Required	$ -	-
395	48	Precast	9.3	1971	$ 3,500.00	53	2	1	3	3	6	No Action Required	$ -	-
396	48	Precast	4.9	1971	$ 1,750.00	53	2	1	3	3	6	No Action Required	$ -	-
326	48	Precast	3.76	1971	$ 1,400.00	53	3	1	1	1	3	Routine Maintenance	$ 500.00	2026
325	48	Precast	7	1971	$ 2,450.00	53	3	1	1	1	3	No Action Required	$ -	-
313	48	Precast	15.06	1971	$ 5,600.00	53	2	1	1	1	2	No Action Required	$ -	-
320	48	Precast	9.5	1971	$ 3,500.00	53	2	1	1	1	2	No Action Required	$ -	-
323	48	Precast	9.14	1971	$ 3,500.00	53	2	1	1	1	2	No Action Required	$ -	-
331	48	Precast	9.3	1971	$ 3,500.00	53	2	1	1	1	2	No Action Required	$ -	-
345	48	Precast	6.5	1971	$ 2,450.00	53	2	1	1	1	2	No Action Required	$ -	-
351	48	Precast	8.79	1971	$ 3,150.00	53	2	1	1	1	2	No Action Required	$ -	-
368	48	Precast	7.97	1971	$ 2,800.00	53	2	1	1	1	2	No Action Required	$ -	-

Table B3: Sanitary Sewer Forcemain Pipe Summary

Description	Pipe Size	Pipe Material	Length (ft)	Year Installed	Replacement Cost	Remaining Useful Life in Years	Condition	Probability of Failure	Consequence of Failure	Criticality	Business Risk	Action	Maintenance Cost	Maintenance Year
Lift Station # 1 to Lagoons	6	DI	6545	1971	$ 654,500.00	53	3	1	5	5	15	Routine Maintenance	$ 500.00	As Needed
Merriweather FM	6	HDPE	11300	2012	$ 508,500.00	94	2	1	5	5	10	Routine Maintenance	$ 500.00	As Needed
Merriweather FM	4	HDPE	10000	2012	$ 420,000.00	94	2	1	5	5	10	Routine Maintenance	$ 500.00	As Needed
Merriweather FM	3	HDPE	5500	2012	$ 1,870,000.00	94	2	1	5	5	10	Routine Maintenance	$ 500.00	As Needed
Merriweather FM	2	HDPE	12300	2012	$ 430,500.00	94	2	1	5	5	10	Routine Maintenance	$ 500.00	As Needed
Merriweather FM	1.5	HDPE	4200	2012	$ 134,400.00	94	2	1	5	5	10	Routine Maintenance	$ 500.00	As Needed
Merriweather FM	1.25	HDPE	27000	2012	$ 810,000.00	94	2	1	5	5	10	Routine Maintenance	$ 500.00	As Needed

Table B4: Sanitary Sewer Forcemain Manhole Summary

Description	Quantity	Structure #	Diameter* (in)	Material	Depth	Year Installed	Replacement Cost	Remaining Useful Life in Years	Condition	Probability of Failure	Consequence of Failure	Criticality	Business Risk	Action	Maintenance Cost	Maintenance Year
Air Relief MH	1	341	48	Precast	N/A	1971	$ 6,000.00	33	4	3	1	3	12	Repair	$ 2,000.00	2019
Air Relief/Flushing Station	24		48	Precast	N/A	2012	$ 144,000.00	74	2	2	2	4	8	Routine Maintenance	$ 12,000.00	Yearly
Flushing Station	17		24	Precast	N/A	2012	$ 76,500.00	74	2	2	2	4	8	Routine Maintenance	$ 8,500.00	Yearly

Table B5: Miscellaneous Sewer Assets

Description	Components	Year	Replacement Cost	Remaining Useful Life in Years	Condition	Probability of Failure	Consequence of Failure	Criticality	Business Risk	Action	Maintenance Cost	Maintenance Year
Lift Station No. 1 - Bergland Station												
	Pump System and Controls	2012	$ 125,000.00	9	1	4	4	16	16	Routine Maintenance	$ 500.00	As Needed
	Centrifugal Pump No. 1	2018	$ 20,000.00	15	1	4	3	12	12	Routine Maintenance	$ 500.00	As Needed
	Centrifugal Pump No. 2	2018	$ 20,000.00	15	1	4	3	12	12	Routine Maintenance	$ 500.00	As Needed
	Lift Station Access and Accessories	1971	$ 80,000.00	28	2	1	3	3	6	Routine Maintenance	$ 500.00	As Needed
	4-foot Dia. Concrete Wet Well	1971	$ 10,000.00	53	2	1	4	4	8	Routine Maintenance	$ 500.00	As Needed
	Electromagnetic Flow Meter	2012	$ 2,500.00	29	4	2	3	6	24	Routine Maintenance	$ 500.00	As Needed
Lift Station No. 2 - Merriweather Station												
	Pump System and Controls	2012	$ 125,000.00	9	2	4	4	16	32	Routine Maintenance	$ 500.00	As Needed
	Submersible Pump No. 1	2012	$ 20,000.00	9	1	4	3	12	12	Routine Maintenance	$ 500.00	As Needed
	Submersible Pump No. 2	2012	$ 20,000.00	9	1	4	3	12	12	Routine Maintenance	$ 500.00	As Needed
	Lift Station Access and Accessories	2012	$ 10,000.00	69	1	1	3	3	3	Routine Maintenance	$ 500.00	As Needed
	6-foot Dia. Concrete Wet Well	2012	$ 8,700.00	94	1	1	4	4	4	Routine Maintenance	$ 500.00	As Needed
	5-foot Dia. Concrete Valve Pit	2012	$ 4,000.00	94	1	1	3	3	3	Routine Maintenance	$ 500.00	As Needed
	4-foot Dia. Concrete Meter Pit	2012	$ 3,200.00	94	1	1	3	3	3	Routine Maintenance	$ 500.00	As Needed
	4 each 4-inch Gate Valves	2012	$ 8,000.00	44	1	2	3	6	6	Routine Maintenance	$ 500.00	As Needed
	Electromagnetic Flow Meter	2012	$ 2,500.00	29	1	2	3	6	6	Routine Maintenance	$ 500.00	As Needed
Grinder Pump Station												
	Grinder Pump Stations (176 total at $5000 each)	2012	$ 880,000.00	29	1	3	4	12	12	Routine Maintenance	$ 500.00	As Needed
Wastewater Stabilization Lagoons												
	10-inch Shear Gate & Handle (6 each)	1971	$ 9,000.00	3	4	2	3	6	24	Routine Maintenance	$ 500.00	As Needed
	12-inch Shear Gate & Handle (9 each)	1971	$ 13,500.00	3	4	2	3	6	24	Routine Maintenance	$ 500.00	As Needed
	Chain Link Fence (3680 Feet)	1971	$ 73,600.00	53	4	2	3	6	24	Routine Maintenance	$ 500.00	As Needed
	Gravel Access Road (4750 S.Y.)	1971	$ 47,500.00	53	3	2	3	6	18	Routine Maintenance	$ 500.00	As Needed
	Lagoon Cell #1	1971	$ 250,000.00	103	2	2	3	6	12	Routine Maintenance	$ 500.00	As Needed
	Lagoon Cell #2	1971	$ 250,000.00	103	2	2	3	6	12	Routine Maintenance	$ 500.00	As Needed
	Lagoon Cell #3	1971	$ 250,000.00	103	2	2	3	6	12	Routine Maintenance	$ 500.00	As Needed

Table B6: Wastewater Stabilization Lagoon Pipe Summary

Upstream Manhole	Downstream Manhole	Pipe Size	Pipe Material	Length (ft)	Approximate Depth (ft)	Year Installed	Cost Per Linear Foot	Lifespan	Replacement Cost	Remaining Useful Life in Years	Condition	Probability of Failure	Consequence of Failure	Criticality	Business Risk	Action	Maintenance Cost	Maintenance Year
399	Point # 400	24"	CMP	450	7	1971	$ 110.00	100	$ 49,500.00	53	3	1	3	3	9	No Action Required	$ -	-
401	402	10"	CI	440	4	1971	$ 75.00	100	$ 33,000.00	53	2	1	3	3	6	No Action Required	$ -	-
401	Lagoon #1	10"	CI	270		1971	$ 75.00	100	$ 20,250.00	53	2	1	3	3	6	No Action Required	$ -	-
402	Lagoon #2	10"	CI	240		1971	$ 75.00	100	$ 18,000.00	53	2	1	3	3	6	No Action Required	$ -	-
402	403	10"	CI	380	6.3	1971	$ 75.00	100	$ 28,500.00	53	2	1	3	3	6	No Action Required	$ -	-
403	Lagoon #3	10"	CI	240		1971	$ 75.00	100	$ 18,000.00	53	2	1	3	3	6	No Action Required	$ -	-
Lagoon #1	404	12"	HDPE	20	5.8	2016	$ 85.00	100	$ 1,700.00	98	1	1	3	3	3	No Action Required	$ -	-
404	Lagoon #2	12"	HDPE	20	5.9	2016	$ 85.00	100	$ 1,700.00	98	1	1	3	3	3	No Action Required	$ -	-
Lagoon #2	405	12"	HDPE	20	5.8	2016	$ 85.00	100	$ 1,700.00	98	1	1	3	3	3	No Action Required	$ -	-
405	Lagoon #3	12"	HDPE	20	5.9	2016	$ 85.00	100	$ 1,700.00	98	1	1	3	3	3	No Action Required	$ -	-
Lagoon #1	406	12"	CMP	3	8	1971	$ 85.00	100	$ 255.00	53	2	1	3	3	6	No Action Required	$ -	-
Lagoon #2	408	12"	CI	3	8	1971	$ 85.00	100	$ 255.00	53	2	1	3	3	6	No Action Required	$ -	-
410	Lagoon #3	18"	CI	40	4.1	1971	$ 100.00	100	$ 4,000.00	53	2	1	3	3	6	No Action Required	$ -	-
410	412	18"	HDPE	190	9.8	2016	$ 100.00	100	$ 19,000.00	98	1	1	3	3	3	No Action Required	$ -	-
Lagoon #3	411	12"	CI	3	8	1971	$ 85.00	100	$ 255.00	53	2	1	3	3	6	No Action Required	$ -	-
413	399	24"	CMP	423	7	1971	$ 110.00	100	$ 46,530.00	53	2	1	3	3	6	No Action Required	$ -	-
406	407	12"	HDPE	46	9.8	2016	$ 85.00	100	$ 3,910.00	98	1	1	3	3	3	No Action Required	$ -	-
407	409	12"	HDPE	363	8.8	2016	$ 85.00	100	$ 30,855.00	98	1	1	3	3	3	No Action Required	$ -	-
408	409	12"	HDPE	48	8.8	2016	$ 85.00	100	$ 4,080.00	98	1	1	3	3	3	No Action Required	$ -	-
409	410	18"	HDPE	170	8.45	2016	$ 100.00	100	$ 17,000.00	98	1	1	3	3	3	No Action Required	$ -	-
411	412	12"	HDPE	50	9.9	2016	$ 85.00	100	$ 4,250.00	98	1	1	3	3	3	No Action Required	$ -	-
412	413	24"	HDPE	25	9.9	2016	$ 110.00	100	$ 2,750.00	98	1	1	3	3	3	No Action Required	$ -	-

Table B7: Wastewater Stabilization Lagoon Structure Summary

Manhole	Shape	Dimensions (ft-inch)	Material	Depth (ft)	Year Installed	Replacement Cost	Remaining Useful Life in Years	Condition	Probability of Failure	Consequence of Failure	Criticality	Business Risk	Action	Maintenance Cost	Maintenance Year
399	Round	4' Dia	Precast	7	1971	$ 2,450.00	53	2	1	3	3	6	No Action Required	$ -	-
401	Rectangle	4.5' X 8'	Precast	3.87	1971	$ 1,935.00	53	2	1	4	4	8	No Action Required	$ -	-
402	Rectangle	4.5' X 8'	Precast	3.75	1971	$ 1,875.00	53	3	1	4	4	12	No Action Required	$ -	-
403	Round	4' Dia	Precast	6.4	1971	$ 2,240.00	53	3	1	4	4	12	No Action Required	$ -	-
404	Rectangle	4' X 4'10"	Precast	5.9	1971	$ 2,950.00	53	2	1	4	4	8	No Action Required	$ -	-
405	Rectangle	4' X 4'10"	Precast	5.9	1971	$ 2,950.00	53	2	1	4	4	8	No Action Required	$ -	-
406	Rectangle	6' X 8'8"	Precast	8.5	1971	$ 4,250.00	53	2	1	4	4	8	No Action Required	$ -	-
407	Round	4' Dia	Precast	10	1971	$ 3,500.00	53	2	1	4	4	8	No Action Required	$ -	-
408	Rectangle	6' X 8'8"	Precast	8.5	1971	$ 4,250.00	53	2	1	4	4	8	No Action Required	$ -	-
409	Round	4' Dia	Precast	8.75	1971	$ 3,062.50	53	3	1	4	4	12	No Action Required	$ -	-
410	Rectangle	4.5' X 8'	Precast	4.1	1971	$ 2,050.00	53	2	1	4	4	8	No Action Required	$ -	-
411	Rectangle	6' X 8'8"	Precast	8.5	1971	$ 4,250.00	53	2	1	4	4	8	No Action Required	$ -	-
412	Round	4' Dia	Precast	9.9	1971	$ 3,465.00	53	2	1	4	4	8	No Action Required	$ -	-
413	Rectangle	5' X 8'	Precast	4	1971	$ 2,000.00	53	2	1	4	4	8	No Action Required	$ -	-

Table B8: Bergland Township Sanitary Sewer Rates

Description	Rate	Rate Type
Bergland Residential Sewer	$ 18.85	Fixed Rate
Bergland Comercial Sewer	$ 18.85 - 219.60	Fixed Rate
Merriweather Residential Sewer	$ 50.00	Per REU
Merriweather Commercial Sewer	$ 50.00	Per REU
Notes: No overage charges are used		
REU = Residential Equivalent Unit		

Table B9: Bergland Township Sanitary Sewer System Yearly Revenues

Description	Number of Users	Monthly Rate	Yearly Income	Monthly Rate	Yearly Income	Monthly Rate	Yearly Income	Monthly Rate	Yearly Income
Year of Rate Increase		**2012**		**2014**		**2015**		**2018**	
Bergland Residential Sewer Users	**157**	**$ 18.00**	**$ 33,902.68**	**$ 18.30**	**$ 34,479.03**	**$ 18.85**	**$ 35,513.40**	**$ 18.85**	**$ 35,513.40**
Commercial Users									
Lake Gogebic Motel	1	$ 101.91	$ 1,222.90	$ 103.64	$ 1,243.69	$ 106.75	$ 1,281.00	$ 106.75	$ 1,281.00
Bergland Bay Bar	1							$ 45.75	$ 549.00
Shangri-La Bar	1	$ 43.68	$ 524.10	$ 44.42	$ 533.01	$ 45.75	$ 549.00		$ -
GOISD	1	$ 18.85	$ 226.25	$ 19.17	$ 230.10	$ 19.75	$ 237.00		$ -
AT&T	1	$ 19.94	$ 239.31	$ 20.28	$ 243.38	$ 20.89	$ 250.68		$ -
Pleasant View Apartments	1	$ 209.64	$ 2,515.68	$ 213.20	$ 2,558.45	$ 219.60	$ 2,635.20	$ 219.60	$ 2,635.20
The Timbers Resort	1	$ 65.99	$ 791.94	$ 67.12	$ 805.40	$ 69.13	$ 829.56	$ 69.13	$ 829.56
USDA - Forest Service	1	$ 29.12	$ 349.40	$ 29.61	$ 355.34	$ 30.50	$ 366.00		$ -
Lake Gogebic Outpost	1	$ 20.38	$ 244.58	$ 20.73	$ 248.74	$ 21.35	$ 256.20	$ 21.35	$ 256.20
Commercial Users Total	**9**	**$ 509.51**	**$ 6,114.16**	**$ 518.17**	**$ 6,218.10**	**$ 533.72**	**$ 6,404.64**	**$ 462.58**	**$ 5,550.96**
Bergland Sewer Charge Totals			**$ 40,016.84**		**$ 40,697.13**		**$ 41,918.04**		**$ 41,064.36**

Description	Number of Users		Monthly Rate	Yearly Income	Monthly Rate	Yearly Income	Monthly Rate	Yearly Income	Monthly Rate	Yearly Income
Year of Rate Increase			**2012**		**2014**		**2015**			
Merriweather Residential Sewer Users	**199**	**199**	**$ 40.00**	**$ 95,520.00**	**$ 45.00**	**$ 107,460.00**	**$ 50.00**	**$ 119,400.00**	**$ 50.00**	**$ 119,400.00**
Merriweather Commercial Sewer Users										
Hoop 'N Holler		4	$ 40.00	$ 1,920.00	$ 45.00	$ 2,160.00	$ 50.00	$ 2,400.00	$ 50.00	$ 2,400.00
Walleye Lodge		6.5	$ 40.00	$ 3,120.00	$ 45.00	$ 3,510.00	$ 50.00	$ 3,900.00	$ 50.00	$ 3,900.00
Ontonagon County Park		7.5	$ 40.00	$ 3,600.00	$ 45.00	$ 4,050.00	$ 50.00	$ 4,500.00	$ 50.00	$ 4,500.00
Hillside Lodge Properties		1.5	$ 40.00	$ 720.00	$ 45.00	$ 810.00	$ 50.00	$ 900.00	$ 50.00	$ 900.00
Merriweather Commercial Sewer Totals	**4**	**19.5**	**$ 40.00**	**$ 9,360.00**	**$ 45.00**	**$ 10,530.00**	**$ 50.00**	**$ 11,700.00**	**$ 50.00**	**$ 11,700.00**
Merriweather Sewer Charge Totals				**$ 104,880.00**		**$ 117,990.00**		**$ 131,100.00**		**$ 131,100.00**
Bergland Township Sewer Charge Total				**$ 144,896.84**		**$ 158,687.13**		**$ 173,018.04**		**$ 172,164.36**

Table B10: Bergland Township Sanitary Sewer System Current Revenue

Description	Number of Users	Number of EDU's	Monthly Rate	Monthly Flat Fee Income	Annual Income
Bergland Residential Sewer Users	**157**		**$ 18.85**	**$ 2,959.45**	**$ 35,513.40**
Commercial Users					
Lake Gogebic Motel	1	5.7	$ 106.75	$ 106.75	$ 1,281.00
Bergland Bay Bar	1	2.4	$ 45.75	$ 45.75	$ 549.00
Pleasant View Apartments	1	11.6	$ 219.60	$ 219.60	$ 2,635.20
The Timbers Resort	1	3.7	$ 69.13	$ 69.13	$ 829.56
Lake Gogebic Outpost	1	1.1	$ 21.35	$ 21.35	$ 256.20
Commercial Users Total	**5**		**$ 462.58**	**$ 462.58**	**$ 5,550.96**
Bergland Sewer Totals	**162**			**$ 3,422.03**	**$ 41,064.36**

Description	Number of Users	Number of REU's	Monthly Rate/REU	Monthly Flat Fee Income	Annual Income
Merriweather Single REU Sewer Users	**199**	**199**	**$ 50.00**	**$ 9,950.00**	**$ 119,400.00**
Merriweather Commercial Sewer Users					
Hoop 'N Holler	1	4	$ 50.00	$ 200.00	$ 2,400.00
Walleye Lodge	1	6.5	$ 50.00	$ 325.00	$ 3,900.00
Ontonagon County Park	1	7.5	$ 50.00	$ 375.00	$ 4,500.00
Hillside Lodge Properties	1	1.5	$ 50.00	$ 75.00	$ 900.00
Merriweather Commercial User Totals	**4**	**19.5**	**$ 50.00**	**$ 975.00**	**$ 11,700.00**
Merriweather Sewer Totals	**203**			**$ 10,925.00**	**$ 131,100.00**
***Any other Commercial Users are charged using an REU of 1**					

Table B11: Bergland Township Historical Sanitary Sewer Cost Analysis

Description	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Operating Revenues:						
Bergland User Charges	$ 40,016.84	$ 40,016.84	$ 40,697.13	$ 41,918.04	$ 41,918.04	$ 41,064.36
Merriweather User Charges	$ 52,440.00	$ 104,880.00	$ 117,990.00	$ 131,100.00	$ 131,100.00	$ 131,100.00
Bergland Township Sewer User Fees Total	**$ 97,573.00**	**$ 154,254.00**	**$ 161,936.00**	**$ 158,906.00**	**$ 165,895.00**	**$ 170,871.85**
Non-Operating Revenues:	$ 92,456.84	$ 144,896.84	$ 158,687.13	$ 173,018.04	$ 173,018.04	$ 172,164.36
Interest Earned	$ 620.00	$ 565.00	$ 652.00	$ 1,170.00	$ 2,087.00	$ -
Other Revenues	$ 2,669.00	$ 6,187.00	$ 841.00	$ 3,553.00	$ -	$ -
Total Revenue:	***$ 100,862.00***	***$ 161,006.00***	***$ 163,429.00***	***$ 163,629.00***	***$ 167,982.00***	***$ 170,871.85***
Operating Expenses:						
Personnel Services	$ 7,720.00	$ 11,863.00	$ 13,996.00	$ 27,114.00	$ 33,255.00	$ 34,252.65
Materials and Supplies	$ 5,151.00	$ 8,155.00	$ 4,909.00	$ 3,217.00	$ 2,046.00	$ 2,107.38
Services	$ 16,248.00	$ 12,604.00	$ 22,217.00	$ 45,620.00	$ 30,360.00	$ 31,270.80
Non-Operating Expenses:						
Sewer Loan	$ -	$ -	$ 33,000.00	$ 34,000.00	$ 35,000.00	$ 36,000.00
Sewer Loan Interest	$ -	$ 49,005.00	$ 49,005.00	$ 48,263.00	$ 47,498.00	$ 46,710.00
Interest and Fees	$ 15,865.00	$ 915.00	$ -	$ -	$ -	$ -
Acquisition of Property/Equipment	$ -	$ -	$ -	$ -	$ 31,045.00	$ -
Bond Reserve Account	$ 2,137.00	$ 13,150.00	$ 6,009.00	$ 10,606.00	$ 29,558.00	$ 15,200.00
Reserve, Replacement, and Improvement Fund (RR	$ -	$ 9,977.00	$ 40,023.00	$ (4,007.00)	$ (5,791.00)	$ 9,300.00
Account Balances:						
Sewer Loan Balance	$ 2,178,000.00	$ 2,178,000.00	$ 2,145,000.00	$ 2,111,000.00	$ 2,076,000.00	$ 2,040,000.00
Bond Reserve Account Balance	$ 2,137.00	$ 15,287.00	$ 21,296.00	$ 31,902.00	$ 61,460.00	$ 76,660.00
RRI Fund Balance	$ -	$ 9,977.00	$ 50,000.00	$ 45,993.00	$ 40,202.00	$ 49,502.00
Total Expenses:	***$ 47,121.00***	***$ 105,669.00***	***$ 169,159.00***	***$ 164,813.00***	***$ 202,971.00***	***$ 174,840.83***
Net Income:	***$ 53,741.00***	***$ 55,337.00***	***$ (5,730.00)***	***$ (1,184.00)***	***$ (34,989.00)***	***$ (3,968.98)***
Sewer Account Balance:	***$ 183,430.00***	***$ 225,008.00***	***$ 260,087.00***	***$ 256,414.00***	***$ 301,359.00***	***$ 310,399.77***
****These figures do not include one time grant or bond proceeds and associated payments***						

Table B12: Bergland Township Future Sanitary Sewer Cost Analysis

YEAR	Current	1	2	3	4	5	10	15	20
Description	**2017-2018**	**2018-2019**	**2019-2020**	**2020-2021**	**2021-2022**	**2022-2023**	**2027-2028**	**2032-2033**	**2037-2038**
Operating Revenues:									
Bergland Sewer Charges	$ 41,064.36	$ 42,296.29	$ 42,719.25	$ 43,146.45	$ 43,577.91	$ 44,013.69	$ 46,258.83	$ 48,618.50	$ 51,098.53
Merriwether Sewer Charges	$ 131,100.00	$ 135,033.00	$ 136,383.33	$ 137,747.16	$ 139,124.63	$ 140,515.88	$ 147,683.60	$ 155,216.95	$ 163,134.58
Total Revenue:	***$ 172,164.36***	***$ 177,329.29***	***$ 179,102.58***	***$ 180,893.61***	***$ 182,702.55***	***$ 184,529.57***	***$ 193,942.43***	***$ 203,835.45***	***$ 214,233.10***
Operating Expenses:									
Personnel Services	$ 34,252.65	$ 35,280.23	$ 35,633.03	$ 35,989.36	$ 36,349.26	$ 36,712.75	$ 38,585.47	$ 40,553.71	$ 42,622.36
Materials and Supplies	$ 2,107.38	$ 2,170.60	$ 2,192.31	$ 2,214.23	$ 2,236.37	$ 2,258.74	$ 2,373.95	$ 2,495.05	$ 2,622.32
Services and Maintenance	$ 31,270.80	$ 32,208.92	$ 32,531.01	$ 32,856.32	$ 33,184.89	$ 33,516.74	$ 35,226.43	$ 37,023.33	$ 38,911.89
Non-Operating Expenses:									
Sewer Loan	$ 36,000.00	$ 37,000.00	$ 38,000.00	$ 39,000.00	$ 40,000.00	$ 41,000.00	$ 47,000.00	$ 54,000.00	$ 62,000.00
Sewer Loan Interest and Fees	$ 46,710.00	$ 45,900.00	$ 45,068.00	$ 44,213.00	$ 43,335.00	$ 42,435.00	$ 37,530.00	$ 31,905.00	$ 25,470.00
Bond Reserve Account	$ 15,200.00	$ 15,200.00	$ 1,140.00	$ -	$ -	$ -	$ -	$ -	$ -
Reserve Replacement, and Improvement Fund (RRI)	$ 9,300.00	$ 9,300.00	$ 23,360.00	$ 24,500.00	$ 24,500.00	$ 24,500.00	$ 24,500.00	$ 24,500.00	$ 24,500.00
Account Balances:									
Sewer Loan Balance	$ 2,040,000.00	$ 2,003,000.00	$ 1,965,000.00	$ 1,926,000.00	$ 1,886,000.00	$ 1,845,000.00	$ 1,621,000.00	$ 1,364,000.00	$ 1,070,000.00
Bond Reserve Account	$ 76,660.00	$ 91,860.00	$ 93,000.00	$ 93,000.00	$ 93,000.00	$ 93,000.00	$ 93,000.00	$ 93,000.00	$ 93,000.00
RRI Fund	$ 49,502.00	$ 58,802.00	$ 82,162.00	$ 106,662.00	$ 131,162.00	$ 155,662.00	$ 278,162.00	$ 400,662.00	$ 523,162.00
Total Expenses:	***$ 174,840.83***	***$ 177,059.75***	***$ 177,924.35***	***$ 178,772.92***	***$ 179,605.52***	***$ 180,423.22***	***$ 185,215.85***	***$ 190,477.09***	***$ 196,126.57***
Net Income:	***$ (2,676.47)***	***$ 269.54***	***$ 1,178.23***	***$ 2,120.69***	***$ 3,097.03***	***$ 4,106.35***	***$ 8,726.59***	***$ 13,358.36***	***$ 18,106.53***
Sewer Account Balance:	***$ 310,399.77***	***$ 310,669.31***	***$ 311,847.54***	***$ 313,968.23***	***$ 317,065.26***	***$ 321,171.61***	***$ 354,156.34***	***$ 410,339.04***	***$ 490,843.71***

Table B13: Sanitary Sewer Televising Comments

Upstream Manhole	Downstream Manhole	Pipe Size	Pipe Material	Length (ft)	Year Installed	Televising Rating	Televising Comments
301	302	8	RPM Truss	289	1971	3	2 cracks, 1 grease area, 1 infiltration, 4 low spots
302	303	8	RPM Truss	199	1971	4	1 encrustation, 8 infiltrations
303	304	8	RPM Truss	191	1971	3	1 crack, 1 encrustation, 3 low spots
304	309	8	RPM Truss	357	1971	3	1 Infiltration Weeper, Water Level Sag
305	310	8	RPM Truss	355	1971	4	1 crack, 2 encrustations, 10 infiltrations, 1 low spot
306	311	8	RPM Truss	322	1971	3	3 Encrustation, 5 Infiltration Weeper
307	306	8	RPM Truss	60	1971	3	Water Level Sag
309	417	8	RPM Truss	38	1971	2	No Comments
310	311	8	RPM Truss	371	1971	3	2 infiltrations
311	312	8	RPM Truss	359	1971	3	3 infiltrations
312	336	8	RPM Truss	202	1971	5	3 breaks, 1 deformed joint, 1 infiltration, 3 line deviations, abandoned survey
313	354	8	RPM Truss	160	1971	3	no issues
316	304	8	RPM Truss	395	1971	4	2 Breaks in Pipe, 3 Encrustation, 8 infiltration (1 runner, 7 weeper)
317	316	8	RPM Truss	208	1971	3	2 Deformation, Infiltration Weeper, Water Level Sag
318	330	8	RPM Truss	181	1971	3	Water Level Sag
319	318	8	RPM Truss	390	1971	2	No Comments
320	319	8	RPM Truss	302	1971	3	1 Crack, Water Level Sag
321	330	8	RPM Truss	372	1971	3	1 Crack, 1 Roots Fine, Water Level Sag
322	329	8	RPM Truss	342	1971	3	2 Cracks, 1 Deformation
323	322	8	RPM Truss	311	1971	3	3 Cracks, 1 Heavy Roots
324	370	8	RPM Truss	129	1971	3	1 Longitudinal Crack
325	324	8	RPM Truss	258	1971	4	4 Cracks (1 Circumferential, 3 Longitudinal) , 3 Roots (2 Med, 1 Fine)
326	417	8	RPM Truss	252	1971	3	1 infiltration, 1 line deviation, survey abandoned
327	342	8	RPM Truss	153	1971	4	Water Level Sag
328	344	8	RPM Truss	291	1971	4	1 Break in Pipe, 3 Cracks, 1 Defective Joint, 4 Infiltration Weeper, Water Level Sag
329	328	8	RPM Truss	204	1971	4	8 Cracks, 2 Infiltration Weeper
330	316	8	RPM Truss	348	1971	2	Separated Joint, Joint Offset
331	321	8	RPM Truss	305	1971	3	Water level Sag
334	301	8	RPM Truss	245	1971	4	1 break in pipe, 5 cracks, 4 low spots
336	337	8	RPM Truss	282	1971	4	1 crack, 1 infiltration, 13 low spots
337	338	8	RPM Truss	156	1971	4	1 obstruction, 22 lower spots
338	340	8	RPM Truss	195	1971	3	5 lower spots
339	338	8	RPM Truss	269	1971	4	1 break, 1 crack, 1 deformation, 1 infiltation
340	333	8	RPM Truss	358	1971	4	10 underwater cameras, 24 low spots, 1 line deviation
342	307	8	RPM Truss	362	1971	4	1 Crack, 1 Infiltration Weeper, 2 Line Deviations(45 deg Bends), Water Level Sag
343	344	8	RPM Truss	224	1971	4	2 Cracks, 1 Encrustation, 6 Infiltration (2 Weeper, 4 Stain), Water Level Sag
344	327	8	RPM Truss	103	1971	2	No Comments
345	305	8	RPM Truss	331	1971	4	7 infiltrations
346	334	8	RPM Truss	238	1971	3	3 cracks, 1 infiltration, 2 low spots
347	346	8	RPM Truss	220	1971	3	14 low spots
348	347	8	RPM Truss	405	1971	3	1 crack
349	369	8	RPM Truss	428	1971	3	1 crack
350	396	8	RPM Truss	47	1971	3	Water Level Sag
351	396	8	RPM Truss	377	1971	3	1 Crack
352	395	8	RPM Truss	300	1971	2	No Comments
353	352	8	RPM Truss	332	1971	2	No Comments
354	312	8	RPM Truss	390	1971	4	4 cracks, 1 encrustation, 13 infiltrations
368	418	8	RPM Truss	183	1971	4	2 cracks, 1 deformation, 2 root areas
369	346	8	RPM Truss	409	1971	3	no issues
370	328	8	RPM Truss	379	1971	4	1 Break in Pipe, 3 Cracks, 2 Fracture, 1 Defective Tap, 1 Roots, 5 Infiltration Weeper
394	353	8	PVC	399	2000	3	Water Level Sag
395	350	8	RPM Truss	415	1971	3	1 Break in Pipe, 1 Crack, 1 Roots Fine
396	318	8	RPM Truss	214	1971	2	No Comments
397	333	8	RPM Truss	420	1971		No Televising
398	397	8	RPM Truss	442	1971		No Televising
417	310	8	RPM Truss	352	1971	4	4 infiltrations
417	326	8	RPM Truss	55.2 TV	1971	4	Settled deposits, survey abandoned, 1 obstruction
418	348	8	RPM Truss	280	1971	3	no issues

APPENDIX C

BERGLAND TOWNSHIP

SMOKE TESTING REPORT

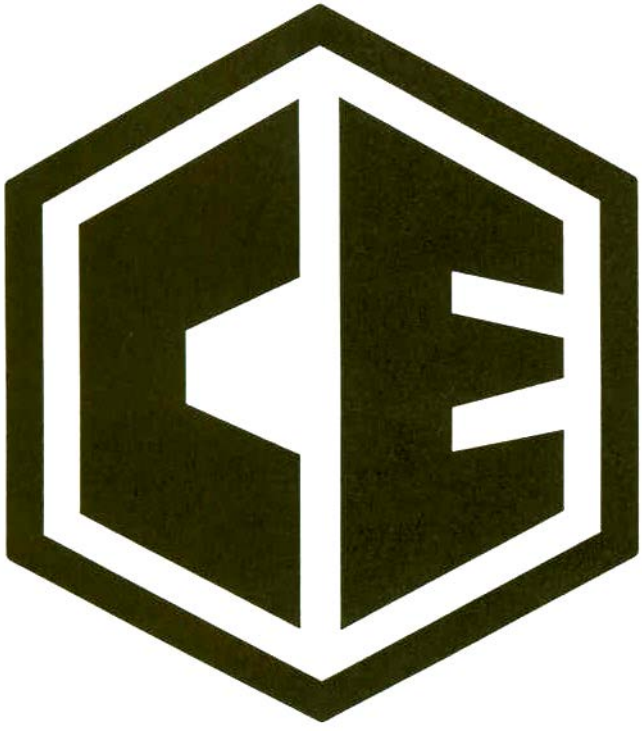
SMOKE TESTING REPORT

FOR THE

BERGLAND TOWNSHIP WASTEWATER COLLECTION SYSTEM

February 2018

Prepared by Coleman Engineering Company
on behalf of Bergland Township



Coleman Engineering

Civil Engineering • Environmental Engineering
Geotechnical Engineering • Land Surveying • Test Drilling
Construction Quality Control • Materials Laboratory Testing

Table of Contents

List of Tables

Appendices

1. Introduction

The following report contains the results of smoke testing conducted in the Bergland Township wastewater collection system during the summer of 2017. The smoke testing was carried out by Coleman Engineering Company (CEC) as part of the Michigan Department of Environmental Quality (MDEQ) Stormwater, Asset Management and Wastewater (SAW) program. The SAW Grant program aims to reduce or eliminate all occurrences of surface inflow and groundwater infiltration into a community's sanitary sewer system. Minimizing inflow and infiltration lessens the load on the treatment facilities and helps to prevent sanitary sewer overflow (SSO). Smoke testing is one of several necessary steps of the inspection process.

2. Purpose, Application, and Limitations of Smoke Testing

The purpose of smoke testing is to help identify sources of direct inflow & infiltration (I&I) into the sanitary sewer system. Sources of I&I include cracked mains and service lines as well as drains with direct piped connections to sanitary sewer laterals, such as driveway and yard drains or roof downspouts. Other sources include defective or open cleanouts on private property. When uncapped clean-outs or manholes are located in low-lying areas they can collect significant surface run-off. Surface inflow and groundwater infiltration create an unnecessary load and increased cost for the treatment facility, and may also potentially cause a SSO.

Smoke testing is the most common method used to identify sources of direct inflow. Its relatively low cost and wide area of coverage make it an efficient and effective inspection method. Smoke testing is performed by first blowing a non-toxic smoke into a sanitary sewer manhole and throughout the sanitary sewer system. The inspection process follows by identifying all areas where smoke emerges from the ground, from drainage structures or from building interiors. The presence of smoke (called "smoke return") indicates potential pathways for direct infiltration into the sanitary sewer system. Therefore, it is important to document all areas where smoke is detected. Documentation typically includes written notes accompanied by photographs and Global Positioning System (GPS) coordinates.

While efficient and economical, smoke testing doesn't necessarily detect all defective laterals and mains. In order for the smoke to emerge from the ground, the soil must not be saturated with groundwater. Surface material also greatly affects the effectiveness of smoke testing. The relative impermeability of pavement and concrete causes testing to be less effective in sections of the sewer system that are located under roadways or driveways. Additionally, smoke testing is not able to identify basements with sump pumps. Finally, smoke testing is not effective for detecting inflow at drainage structures in unoccupied or abandoned buildings and residences due to visual limitations. Smoke testing also has limited effectiveness in detecting inflow on private property with restricted access (i.e. due to the presence of fences or locked gates).

3. Smoke Testing Program

Smoke testing was conducted throughout the entire 16100 linear feet (LF) of Bergland Township's gravity wastewater collection system. The smoke testing helped to determine problems areas where potential I&I can be eliminated.

Figure 1 – Aerial Map of the City of Kingsford with manhole and sanitary sewer locations is located in Appendix A. The map depicts the sanitary sewer system overlaid on an aerial map of the City.

Figure 2 – Smoke Testing Incident Locations is located in Appendix A. This map shows the incident locations and corresponding reference numbers. Incidents with I&I potential are shown as a separate color from those with non-I&I potential.

Smoke testing was conducted over a two-day period between May 23, 2017 and May 24, 2017. This particular timeframe helped to ensure that groundwater levels would be near a seasonal low, thus maximizing the effectiveness of the tests. The smoke testing comprised of testing small segments of the sewer system which typically ranged from 500-1000 LF per test "run". After activating the smoke blower machine, the field crew observed all occurrences of smoke returns or other issues (called "incidents"). The field crew then documented the incidents on field reports, where the following information was recorded for each test run:

- Inspector(s);
- Date/time;
- Manhole set-up location;
- Diagram of segments monitored; and
- Notes/comments identifying:
    - Result status (i.e. no issues identified, suspect areas, etc.)
    - Incident location (address and/or street)
    - Leak source (service connection, sewer main, building interior/basement)
    - Leak type (see Table 1)
    - Leak size (indication of potential for inflow or infiltration)
    - Leak surface cover (asphalt, concrete, gravel, dirt, grass, etc.)

In addition, the field crew used a digital camera to photograph all incidents. CEC formalized Smoke Testing Incident Reports (Appendix B) based on data from the field crew.

Table 1: Leak Type Codes and Descriptions

Leak Type Codes	Description
CCD	Clean-out cap defective
CCM	Clean-out cap missing
DT	Drain tile (or yard drain)
MHC SAN	Sanitary manhole cover
NS	No smoke from vent
O	Other
RWL	Rainwater (roof) leader
SC	Service connection (lateral)
SI	Smoke in interior/building
SM	Sewer main
U	Source unknown

4. Smoke Testing Findings

Fourteen smoke testing incidents were documented, with ten incidents indicating the possibility for inflow or infiltration into the sanitary sewer system. These incidents include five occurrences of uncapped/defective clean-out caps, three unknown service lateral incidents, and two exposed footing drains connected to the service lateral. The remaining four incidents were recorded as "smoke in interior/basement", which indicates faulty plumbing within a private residence or business. The Smoke Testing Incident Reports (Appendix B) indicate that all of the incidents occurred on private property or abandoned lots. Table 2, below, summarizes the smoke testing results.

Table 2: Summary of Smoke Testing Results

Leak Type	Number of Leaks
Uncapped/Damaged clean-out	5
Lateral/possible buried cleanout	3
Footing Drains	2
Smoke in building/basement	4
Total	**14**

Of the fourteen incidents, a majority were uncapped clean-outs or broken laterals. These occurrences provide significant opportunity for groundwater infiltration and surface water inflow.

Overall, the smoke testing identified relatively few potential sources of direct inflow to the sewer system. While this may be an indication of the sewer laterals and mains being in good overall

condition, it is possible that the smoke simply isn't reaching the ground surface in many areas due to saturated soil or impermeable surface material. Not all leaks will be identified by the smoke testing program, and a lack of smoke incidents does not necessarily reflect that a pipe segment is not subject to I&I. Since much of the public portion of the sewer system (sewer mains, manholes) lies under pavement, smoke may not be able to emerge through the ground surface. Therefore, other methods such as visual manhole inspections or CCTV inspection are more appropriate for identifying potential sources of I&I in sewer mains and manholes. CEC field personnel have visually inspected all manholes within the system and, along with smoke testing, have used the information to flag the pipe segments which they deem most necessary to be inspected by CCTV. Results of the manhole inspection can be found in the Asset Management Plan.

5. Planned Follow-up Actions

Based on results from the smoke testing, the Township intends to take the following actions to verify identified sources of I&I as well as to address other potential issues:

- CCTV inspection of all mains where incidents were identified;
- CCTV inspection of additional pipe segments, such as high-density residential areas or low-lying areas near the lift station;
- Review existing CCTV inspection records for sewer mains identified as potential sources of I&I;
- Locate, uncover, and inspect any additional manholes that were previously unidentified, and make corrections to the system maps where needed.

Based on the results of the above verification activities, the Township will take the following actions:

- Notify the property owners with illegal drains or where plumbing issues were encountered;
- Seal and/or raise manholes subject to potential surface inflow through the manhole cover;
- Identify areas where repairs or replacements are needed for any sewer main or lateral for which the Township is responsible and issue a repair work order to be covered under the SAW Grant as applicable.

The Township has limited leverage to enforce property owner-compliance with Notices to Repair, especially in vacant lots with ambiguous ownership. In these cases, it will be most effective for the Township to perform repairs at the property lines whenever possible. The work will either be done internally by Township personnel or by a hired contractor.

The Township will track follow-up activities related to each identified smoke testing incident in a spreadsheet database. The database will include the following information:

- Smoke testing date, location, and leak type information;
- Date and results of follow-up verification activities;
- Name and contact information of property owners;
- Date when property owner was notified of any violations;
- Date and confirmation that correction has been verified to be complete; and
- Follow-up enforcement action taken if correction is not completed.

Appendix D contains the Smoke Testing Follow-up Actions spreadsheet for use by the City.

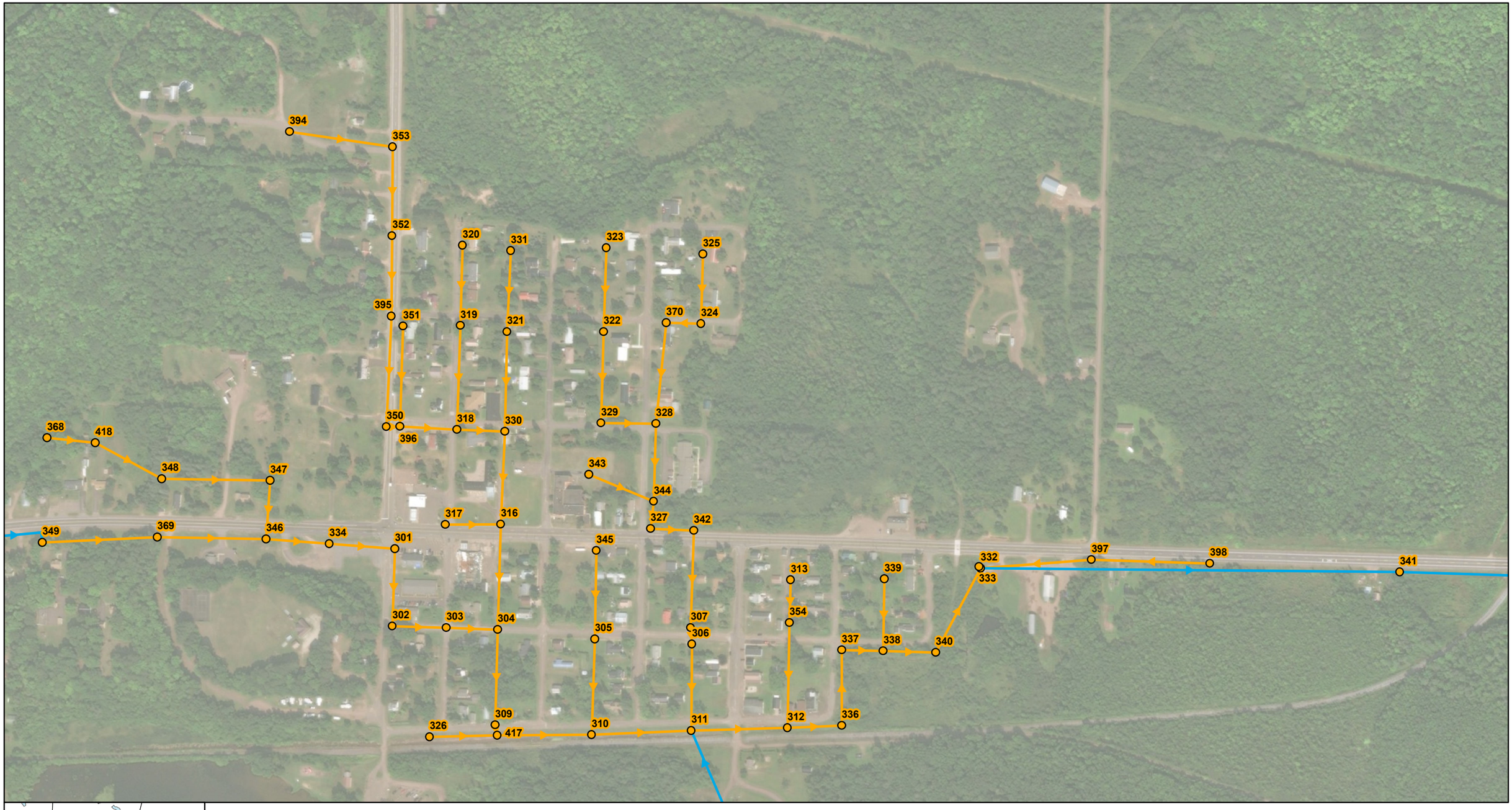
6. Conclusions

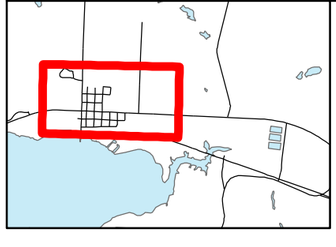
Smoke testing was conducted in all areas of the Bergland Township wastewater collection system in an attempt to identify potential sources of I&I. Even though the entire sewer system was tested, only a small number of problem areas were identified. Most of the issues identified are easy-to-fix uncapped clean-outs and some potentially broken service laterals. The fact that so few incidents were reported may be due to smoke testing not being a completely effective method for identifying sources of I&I. The ineffectiveness of smoke testing is mainly due to saturated soils, impermeable surface materials and depth of sewer mains. These conditions will not allow the smoke to penetrate through the surface of the ground.

With the smoke testing 100% complete, the Township will use these results along with other inspection methods, such as CCTV and visual inspection of clean-outs and manholes in an effort to identify and prioritize other potential sources of I&I for repair and rehabilitation.

Appendix A

Bergland Township Sanitary Sewer Map





Gravity Manhole

Gravity Sewer Main

Forcemain Sewer

Bergland Township
Sanitary Sewer System

1 inch = 350 feet

N
W E
S

Appendix B

NASSCO Smoke Testing Specifications

SEWER AND MANHOLE - SMOKE TESTING
(As Provided by NASSCO)

PART 1 – GENERAL

1.01 Scope of Work

A. It is the intent of this specification to provide for the smoke testing materials and procedures to be used in the investigation of the sanitary sewer facilities as shown on the Project Maps. All materials and procedures shall be consistent with these specifications, current industry standards, and as approved by the Engineer.

B. The Contractor shall minimize the physical entry of personnel into the sanitary sewer facilities. If required, manhole entry shall be in accordance with Federal, State, and local regulations for confined space entry and other regulations that may apply. The Contractor shall provide all safety equipment required for manhole entry operations, including harnesses, ventilation equipment, etc.

1.02 Submittals with this section.

A. Work Permits from applicable local, state and federal agencies

B. Notification Documents

C. Method of Smoke Production

D. Field Log Worksheets written or in DVD format if specified.

E. Final Compiled Reports written or in DVD format if specified.

F. Identification for all Employees on-site

1.03 Personnel Qualifications

A. A single Crew performing the testing shall be no less than 3 persons. One supervisor and two helpers per crew. One person operates the blower and smoke device. The other two inspect the run for evidence of smoke.

B. The Contractor's employees performing the smoke testing under the provisions of these specifications shall be properly trained and thoroughly experienced in the use of the equipment and procedures. The supervisor shall have at least two years of previous testing experience obtained in the last four years prior to the date of award. As a minimum, the helpers shall have at lease five (5) days of verifiable, previous testing experience. The five (5) days of experience shall have been acquired within a maximum of six (6) months prior to the date of award of this contract, unless specifically waived by the Engineer.

C. A list of employees to be used shall be provided to the Engineer to keep on file at the Municipal Offices. The information provided shall include the name and a copy of the driver's license of each individual. Each employee shall be provided with a photo ID identifying him by name, the name and contact information for the company. All job supervisors will have cards with contact information for the supervisor and company to provide to residents if requested.

D. The Contractor shall require all personnel to demonstrate good judgment, in performing the testing.

E. The Contractor shall take appropriate action to ensure that his employees are polite to the public in all aspects of the work and that immediate assistance is provided to property owners if needed.

PART 2 – PRODUCTS

2.01 Blowers

A. The Contractor shall provide a portable blower designed and built specifically for the use of smoke testing. The blower shall be self-contained and powered by a minimum three (3) horsepower (HP) gasoline engine and be capable of producing a minimum of 2000 cubic feet of air per minute when working as a blow-in ventilator and 4000 cfm when working as a suction ventilator.

B. The base of the blower shall have appropriate adapters and seals to make a good connection to the manhole without excessive loss of air and smoke.

2.02 Smoke Production

A. Smoke bombs shall produce a chemical reaction generating white to gray smoke, leaving no residue, and shall be non-toxic and non-explosive. Each bomb shall be capable of producing adequate volume of smoke when used alone or in combination with a number of bombs for the duration of the test.

B. Smoke Fluid shall produce smoke when exposed to the heat of the exhaust system of the motor for the blower. The smoke generated shall be white to gray smoke, leaving no residue, and shall be non-toxic and non-explosive.

2.03 Other Equipment

In addition to the blower, the Contractor shall provide all other equipment, tools, and incidentals required to perform smoke testing as required by these specifications and as directed by the Engineer including but not

limited to sewer line stoppers, sand bags, cameras, confined space entry equipment, etc.

PART 3 – EXECUTION

3.01 Work Progress – The work shall generally progress as follows:

A. The Contractor shall apply for and obtain work permits for all work to be performed in State and/or County Highways. All required insurances, traffic control measures, and other terms of the permit shall be provided to the satisfaction of the Agency Permit Engineer and/or Project Engineer.

B. The Contractor shall have all submittals required reviewed, including the form of the field worksheet, etc, by the Engineer. Work shall not proceed until acceptance of all submittals by the Engineer.

C. A Work Schedule shall be submitted for review and approval by the Engineer. No field testing or notification may proceed until the schedule has been approved by the Engineer. After approval of the WORK SCHEDULE by the Engineer, the Contractor shall not make any revisions or modifications to it without the written approval of the Engineer.

D. Pre-notifications – With the first notification, the contractor shall notify all affected residents in the Municipality that smoke testing will occur no more than two weeks prior and not less than one week prior to the date of the testing. This notification will be by using a printed flyer hung on each door of affected homeowners and/or a press release in the Official newspaper of the Municipality. The flyer and/or press release notice shall include:

1. Contact numbers for the Contractor and the Municipality, if residents want additional information. (*All persons who will be in contact with the public should be well versed in the smoke testing procedures, work schedule and content of all public notices*).

2. Warnings to the homeowner that Individuals with respiratory, heart problems, or others who should never be exposed to smoke, should be removed from the premises prior to the tests. Others, such as house confined invalids, sleeping shift workers and locked in animals should be identified and evacuated before the test. The notice should also request that homes with these individuals be requested to be registered as “Homes of Special Concern.”

E. Regulatory Notifications – The Contractor shall notify the Local Police and Fire Departments, the County, the County Department of Health and the State Department of Environmental protection, just prior to distributing the flyers and publishing the Press Release to the General Public.

F. Daily Notifications – In the Area of Daily Testing, the Contractor shall notify:

1. All providers of emergency services by phone providing the area to be tested during the next day of work. Notification shall be 24 hours in advance of the testing.

2. The Contractor shall notify, by hand delivery of a notification letter, door knob hangtags or other acceptable methods to each address, all residences and businesses in the area to be tested 24 hours in advance of the testing. All notification letters or hangtags shall be bilingual in Spanish and English.

3. The day of the testing, the Contractor shall check with all homes of special concerns to be sure that all persons that may be sensitive to smoke will be out of the home prior to testing.

G. It shall be the Contractor's responsibility to keep adequate records of all notifications to emergency services and to produce them upon request by the Engineer. Failure to comply with this requirement may be cause to suspend the Contractor's operations until compliance is achieved.

H. Performing the Testing

I. Reporting the Data.

3.02 Work Schedule

A. Upon award of the Contract and prior to commencing any work, the Contractor shall provide a complete WORK SCHEDULE to the Engineer for review and approval. The Work Schedule shall be typed and shall indicate the planned progress for the proposed work.

B. The Work Schedule shall indicate the following:

1. Street Name (when in easements - the names of the abutting streets).

2. Street Limits (cross streets or property addresses).

3. Upstream and Downstream Manhole Numbers (from Project Maps).

4. Date of Testing.

5. Starting Time.

6. Ending Time.

C. Acceptable Periods of Work

1. The Contractor shall not commence testing before 8:00 a.m. and shall terminate testing no later than 5:00 p.m. each day.

2. If the Contractor wishes to test before 8:00 a.m. in commercial areas, such testing shall be shown on the submitted WORK SCHEDULE and is subject to the approval of the Engineer.

3. Work times in Commercial areas shall be scheduled to be prior to the opening of the majority of the businesses in that area.

4. Smoke testing shall not be performed on weekends or on holidays without the prior approval of the Engineer.

D. Contractor shall not perform smoke testing on days that, in the opinion of the Engineer, will hinder the results of the test. (For example, when high winds, heavy rains, or excessively high groundwater levels would interfere with the effectiveness of the testing).

3.03 Performing the Testing

A. Procedure

1. Safety

   (a) The Contractor and his personnel shall be aware of and shall follow all Federal, State, and Local safety laws and regulations.

   (b) No entry into any part of the collection system shall be permitted until the Contractor has demonstrated that on-site personnel has been trained in applicable safety procedures and has the equipment on-site to allow those procedures to be followed.

   (c) Traffic Control. The area of work shall at all times be protected by means of an adequate number of cones, barricades, flags, or whatever means is necessary to properly and safely protect both vehicular and pedestrian traffic. Flag men shall be provided in all streets. Further requirements for Traffic control may be imposed by the specific agency having jurisdiction.

   (d) Any condition deemed to be an unsafe condition shall be immediately corrected by the Contractor. The failure of the Engineer or his representatives to bring a potentially dangerous situation to the Contractor's attention shall not relieve the Contractor from his responsibility for providing a safe work area.

2. Unless otherwise approved by the Engineer, the sections of sewer subject to testing shall:

   (a) Consist of a central manhole, where the blower will be positioned, and an upstream and downstream manhole and the sewer pipe between them. With three (3) manholes and two pipe sections, lengths should not exceed 800 feet.

   (b) Consist of sections two (2) manholes and one pipe section. This allows a run of 400 to 800 ft of pipe.

3. Flow Control - It is the intent of this specification that the smoke testing be accomplished without the need for bypass pumping. The Contractor shall provide temporary plugs, sandbags, or flow barriers as required to contain an adequate volume of smoke within the section of sewer being tested, or to limit the extent of sewer subjected to pressurized smoke. The Contractor shall monitor the resulting surcharged sewer at the manhole upstream of the section of sewer being tested, and prevent overflow conditions from occurring by removing the flow barriers...

4. Prior to placing any smoke into a manhole, the Contractor shall first evacuate the system with a blower to ensure that any collection of explosive gas and any odor that may be introduced into the homes and businesses have been dispersed prior to pressurizing the sewer with smoke. Evacuation may be accomplished by removing the manhole covers of all manholes in the run, then placing a vacuum on the manhole where the blower is located, or, then blowing air into the manhole.

5. All smoke testing information shall be accurately and neatly recorded on field worksheets and on 200 scale maps (1 in. = 200 ft**.)** or other maps of suitable scale as provided by the Engineer. The final report and information may be transferred to a computer generated log sheet together with related digital photographs taken during the project execution if specified in the contract.

6. For each sewer main tested, the Contractor shall prepare a field log identifying each point of smoke exfiltration from:

   (a) Roof gutters.

   (b) Sewer cleanouts

   (c) Leakage in house laterals.

   (d) Patio or area drains.

   (e) Storm drain cross connections.

   (f) Any other source not stated above

   (g) Indicate if roof vents showed evidence of smoke or not.

7. The points of exfiltration, as identified above, shall be referenced and dimensioned to permanent landmarks or house or lot numbers.

8. A photograph of all leaks using a digital camera or approved substitute shall be included in the field log. Photographs of smoke evidence shall have a location indicated in the photograph using a heavy marker and heavy card stock and/or recorded on a DVD disk if specified. All photographs shall be clearly cross-referenced to the typed and/or computer generated log indicating the location of the leak.

9. The report shall reference the alphanumeric manhole numbers shown on the Project Maps.

10. The Contractor shall prepare a bound report and/or DVD record, if specified, of the smoke testing as specified. The report shall

    (a) Contain a typed log that clearly identifies each sewer main tested.

    (b) Have all field data checked for accuracy and compiled into typewritten reports.

    (c) Contain the digital data (i.e. photographs) at the end of the project.

    (d) Contain copies of the materials used to make notifications and a log of the daily notifications to the emergency and safety personnel.

    (e) Submit Two (2) complete copies of the report and/or the DVD to the Engineer for review. Upon receiving the Engineer's review comments, the Contractor shall edit or revise the report and/or DVD as necessary and resubmit five copies of the final report and/or DVD to the Engineer.

END OF SECTION

Appendix C

Smoke Testing Incident Reports

Incident Location: 649 M-28, State Bank of Ewen
Testing Date: 5/23/2017

Upstream Manhole: 369
Downstream Manhole: 346
Result: Positive

Leak Source: Service Connection
Leak Type: Cleanout Cap Defective
Leak Size: Medium
Leak Surface Cover: Grass

Observations: Smoke emitted from clean-out cap at the northwest corner of the bank.

Comments: Cleanout capped is improperly sealed.

Incident Location: Ottawa National Forest/ Bergland Heritage Center
Testing Date: 5/23/2017

Upstream Manhole: 349
Downstream Manhole: 369
Result: Positive

Leak Source: Service Connection
Leak Type: Cleanout Cap Missing
Leak Size: Medium
Leak Surface Cover: Grass/Concrete pad

Observations: Smoke emitted from clean-out between the main bulding and the garage.

Comments:

Incident Location: 103 Maple St
Testing Date: 5/23/2017

Upstream Manhole: 305
Downstream Manhole: 310
Result: Positive

Leak Source: Service Connection
Leak Type: Service Connection (lateral)
Leak Size: Medium
Leak Surface Cover: Grass

Observations: Smoke emitted from ground surface next to the northeast corner of the building.

Comments:

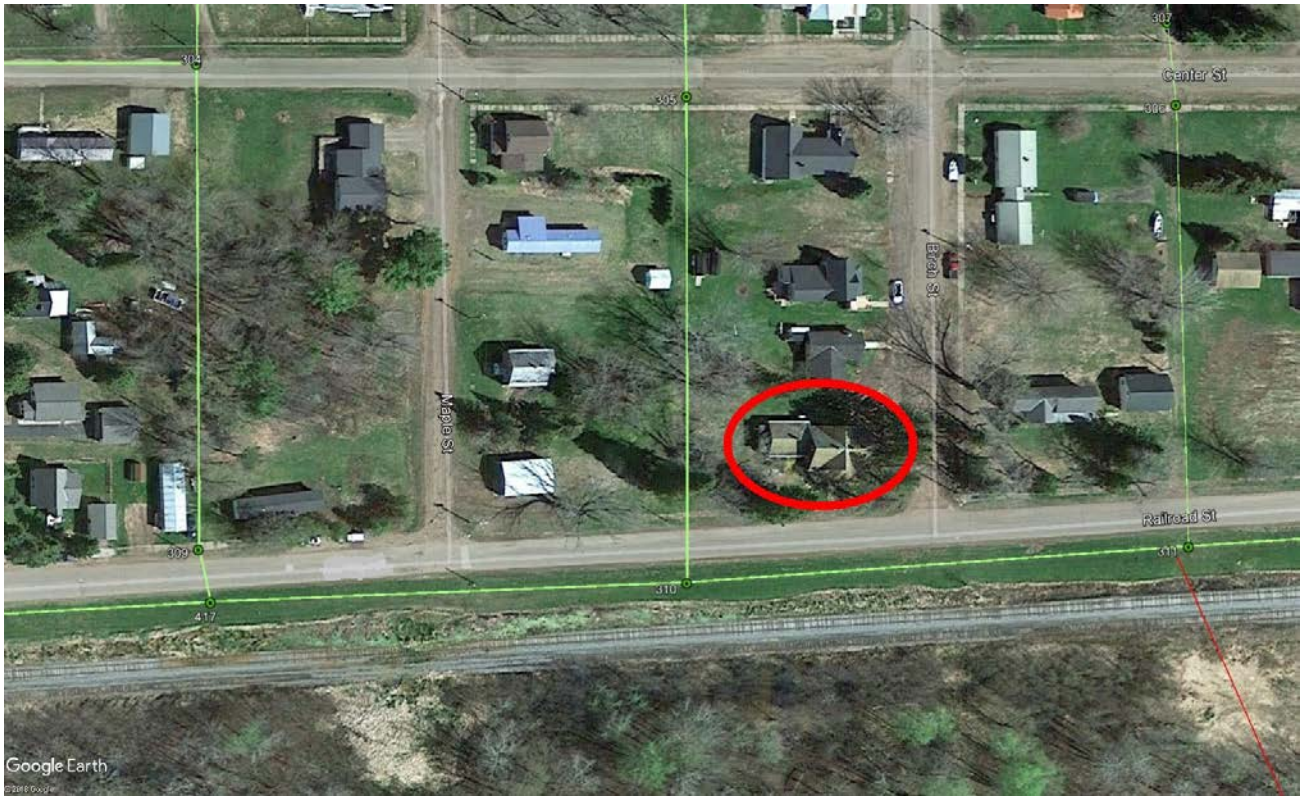
Incident Location: Railroad St
Testing Date: 5/23/2017

Upstream Manhole: 305
Downstream Manhole: 310
Result: Positive

Leak Source: Interior of Building
Leak Type: Smoke in Building
Leak Size:
Leak Surface Cover:

Observations: Smoke visible inside house.

Comments: House seems to be abandon.



Incident Location: 205 Cedar St
Testing Date: 5/23/2017

Upstream Manhole: 339
Downstream Manhole: 338
Result: Positive

Leak Source: Service Connection
Leak Type: Cleanout Cap Missing
Service Connection (lateral)
Leak Size: Medium

Leak Surface Cover: Grass

Observations: Smoke emitted from uncapped clean-out and from ground surface in empty lot, south of the house.

Comments: Possible uncapped lateral prior to demolition of house.

Incident Location: 205 Cedar St
Testing Date: 5/23/2017

Upstream Manhole: 339
Downstream Manhole: 338
Result: Positive

Leak Source: Interior of Building
Leak Type: Smoke in Building
Leak Size:
Leak Surface Cover:

Observations: Smoke visible inside of home.

Comments:

Incident Location: 201 Center St
Testing Date: 5/23/2017

Upstream Manhole: 342

Downstream Manhole: 307

Result: Positive

Leak Source: Service Connection

Leak Type: Service Connection (lateral)

Leak Size: Medium

Leak Surface Cover: Grass

Observations: Smoke emitted from ground surface west of house towards empty lot.

Comments: Probable connection to a demoltioned house to the west.

Incident Location: Church on corner of Woodland and Birch
Testing Date: 5/23/2017

Upstream Manhole: 322
Downstream Manhole: 329
Result: Positive

Leak Source: Service Connection
Leak Type: Cleanout Cap Missing
Leak Size: Medium
Leak Surface Cover: Grass

Observations: Smoke emitted through clean-out.

Comments: Missing or broken cap.

Incident Location: 501 Maple St
Testing Date: 5/23/2017

Upstream Manhole: 323
Downstream Manhole: 322
Result: Positive

Leak Source: Interior of Building
Leak Type: Smoke in Building
Leak Size:
Leak Surface Cover:

Observations: Smoke visible inside home.

Comments:

Incident Location: 505 Elm St
Testing Date: 5/24/2017

Upstream Manhole: 331

Downstream Manhole: 321

Result: Positive

Leak Source: Service Connection

Leak Type: Cleanout Cap Defective

Leak Size: Medium

Leak Surface Cover: Grass

Observations: Smoke emitted from clean-out east of house, towards alley ROW.

Comments: Clean out cap broken.

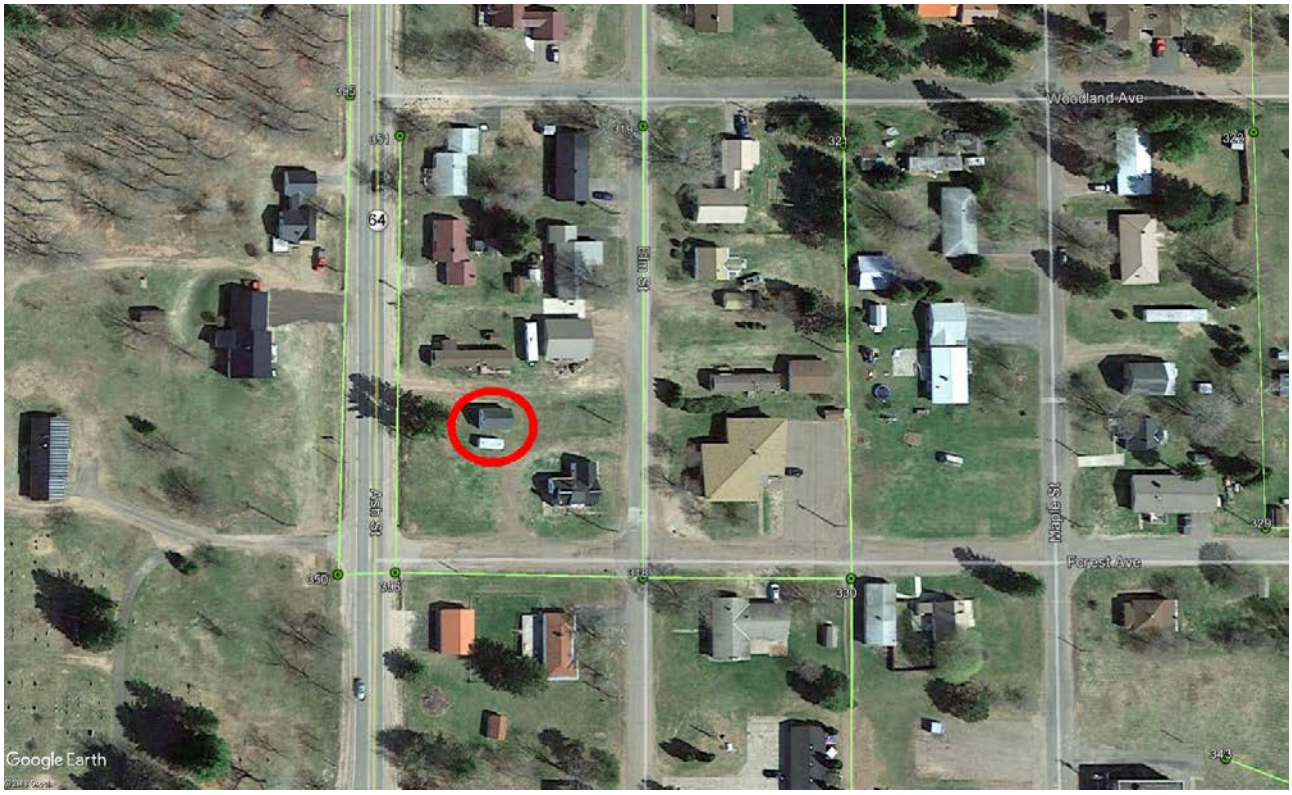
Incident Location: Elm St
Testing Date: 5/24/2017

Upstream Manhole: Unknown
Downstream Manhole: Unknown
Result: Positive

Leak Source: Interior of Building
Leak Type: Smoke in Building
Leak Size:
Leak Surface Cover:

Observations: Smoke visible inside home

Comments:



Incident Location: 639 Mary Lane
Testing Date: 5/24/2017

Upstream Manhole: None

Downstream Manhole: 394

Result: Positive

Leak Source: Service Connection

Leak Type: Drain Tile

Leak Size: Medium

Leak Surface Cover: Grass/Gravel

Observations: Smoke emitted from exposed footing drain pipe on both sides of garage.

Comments: Footing drains connected into sanitary sewer system.

APPENDIX D

BERGLAND TOWNSHIP

FLOW METERING REPORT

Bergland Flow Metering Report

TABLE OF CONTENTS

APPENDIX

EXECUTIVE SUMMARY

Bergland Township (Township) is located in Ontonagon County in the Upper Peninsula of Michigan. The community is situated on M28 on the north side of Lake Gogebic. The Township sanitary sewer collection system consists of approximately 16,000 feet of pipe that serves approximately 365 customers.

The following report contains the results of the wastewater collection system flow meter testing conducted in the Township ranging from June through July of 2018. The flow meter testing was conducted by Coleman Engineering Company (CEC) and the Township as part of the Michigan Department of Environmental Quality (MDEQ) Storm Water, Asset Management and Wastewater (SAW) Grant program.

Enforcement of the Township's ordinances regarding not allowing stormwater and groundwater drains to be connected public sanitary sewer should be pursued.

1.0 INTRODUCTION

The Township sanitary sewer collection system consists of approximately 16,000 feet of pipe that serves approximately 365 customers.

The following report contains the results of the wastewater collection system flow meter testing conducted in the Township ranging from June through July of 2018. The flow meter testing was conducted by Coleman Engineering Company (CEC) and the Township of Ironwood (Township) as part of the Michigan Department of Environmental Quality (MDEQ) Storm Water, Asset Management and Wastewater (SAW) Grant program. The SAW grant program aims to identify occurrences of surface inflow and groundwater infiltration (I&I) into a community's sanitary sewer system. Minimizing I&I lessens the load on the treatment facilities and helps to prevent sanitary sewer overflow (SSO).

1.2 Purpose

The purpose of flow monitoring is to locate areas within the sanitary sewer system with high I&I. Once areas with high I&I are identified, further investigation, typically in the form of televising or smoke testing, can be completed to determine the specific cause. Future projects can then be planned to eliminate or reduce I&I.

1.3 Methods and Procedures

Flow monitoring was conducted in nineteen different study areas of the Township from June through July of 2018. Flow meters were left in place for various periods ranging from one to five weeks. Each study location included a different configuration of three to ten flow meters placed in

sanitary manholes at designated locations in the area. This process included selecting manholes that would best represent the sanitary system in the area. Often, meters were placed downstream from one another to distinguish changes in the wastewater levels as it flowed through the system. Once the configuration for the meters was planned, technicians from CEC and the Township secured the meter sensor within the selected manholes.

The flow meters used were iTracker Smart Inflow and Infiltration Micro Detection Monitor. The flow meters were programed to collect data every 5 minutes while in operation. Typically, flow meters are set to indicate flow velocity with time. Flow versus time graphs are created by interpolating data recorded by a flow meter in set time intervals and represent the diurnal flow curve (typical daily flow curve) recorded over a given monitoring period.

Data was uploaded from the meters throughout the time they were in place, usually in two week periods. Once the data was retrieved from the meters, it was analyzed by examining how the raw flow volumes in the structure changed over time. Each meter commonly followed a daily pattern from which anomalies could be identified. Any such irregularities in a meter's pattern were compared to the precipitation data for evidence of I&I.

1.4 Limitations

While flow monitoring can help locate the general area or direction that a problem is coming from, it is hard to pinpoint the spot by flow monitoring alone. Additional investigation is usually needed to locate the exact location of the problem.

Additional factors affect the sewer flows beyond what was measured during this flow monitoring analysis. Such as rainfall intensity, rainfall duration, groundwater saturation, and existing snowpack depth.

1.5 Analysis

As noted above, this report is not meant to determine quantitatively the amount of clear water entering the sanitary sewer system, but rather to indicate the type of I&I problem that exists in an area of the system and the relative magnitude of the problem compared to other areas of the system.

Flow and volume in sanitary systems generally follows a diurnal daily pattern rising and falling with times of activity and inactivity by users. A peak often occurs during the morning when residents are getting ready for work or school and higher levels continue until a trough develops overnight when residents are asleep. Figure No. 2 – Typical Diurnal Pattern found below shows the typical diurnal daily pattern. Irregularities in the normal daily patterns can indicate problems in the system such as I&I.

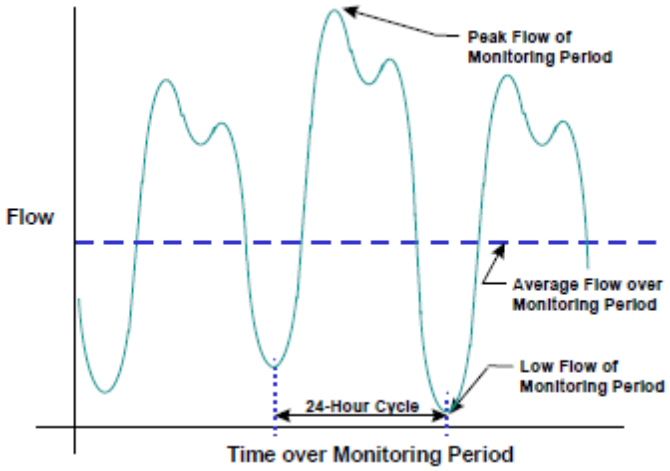


Figure No. 2 – Typical Diurnal Pattern

Inflow

Inflow is defined as water entering the sanitary sewer system through non-sanitary sewer connections, such as storm catch basins, roof drains, and sump pumps. These connections will generally correlate to wet weather events, resulting in increased flow during and shortly after wet weather. Inflow is generally characterized as having a greater peaking factor than infiltration. Figure No. 3 – Typical Inflow Chart Response Pattern shows the typical flow meter chart reading associated with inflow entering the wastewater system. Rainfall is shown in blue at the top of the chart with the flow, as seen by the meter, shown in red at the bottom of the chart. The response pattern is typically a sharp spike with short duration.

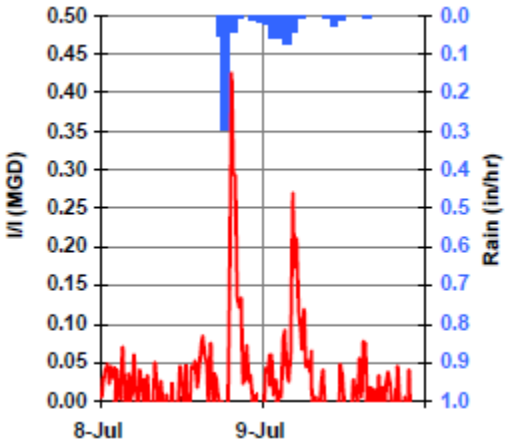


Figure No. 3 – Typical Inflow Chart Response Pattern

Inflow creates a peak flow problem in the sewer system and often dictates the required capacity of downstream pipes and transport facilities to carry the peak instantaneous flows. Because the

response and magnitude of inflow is tied closely to the intensity of the storm event, the short-term peak instantaneous flows may result in surcharging and overflows within a collection system.

Inflow locations are usually less difficult to find and less expensive to correct. These sources include direct and indirect cross connections with storm drainage systems, roof downspouts, and various types of surface drains. Generally, the costs to identify and remove sources of inflow are low compared to the costs of building new facilities to convey and treat the resulting peak flows.

Infiltration

Infiltration is defined as water entering the sanitary sewer system through sources such as leaking joints in sanitary sewer pipes, cracks in manholes, broken pipes, and root intrusion. This water is generally groundwater and will be characterized as a base flow that is seen even during dry weather. During wet weather events, infiltration volume generally increases gradually due to saturated soil surrounding the sanitary sewer.

Figure No. 4 – Typical Infiltration Chart Response Pattern shows the typical flow meter chart reading associated with inflow entering the wastewater system. Rainfall is shown in blue at the top of the chart with the flow, as seen by the meter, shown in red at the bottom of the chart. The response pattern is typically a gradual increase followed by a gradual recession.

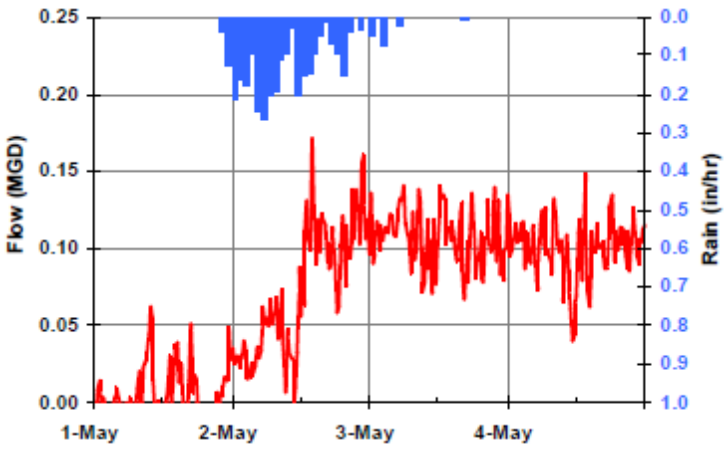


Figure No. 4 – Typical Infiltration Chart Response Pattern

Infiltration typically creates long-term volume related problems. The major impact is the cost of pumping and treating the additional volume of water.

Infiltration can be groundwater dependent infiltration and/or rainfall induced infiltration. Groundwater dependent infiltration depends on the depth of the groundwater table above the pipes and the amount of pipe that is submerged. The variation of groundwater levels and the subsequent

infiltration rates are seasonal by nature. On a day-to-day basis, groundwater infiltration rates are relatively steady and will not fluctuate widely.

Rainfall induced infiltration occurs as a result of rainfall and enters the sewer system through pipe defects similar to groundwater infiltration. The storm water percolates directly into the soil and then infiltrates into the pipes where defects occur. Typically, the time of concentration for rainfall related infiltration may be 24 hours or longer, and depends on the soil permeability and saturation levels.

Inflow and Infiltration

Inflow and infiltration can exist together in many situations. The resulting flow can be seen in the example chart response Figure No. 5 – Typical Inflow and Infiltration Combination Chart Response Pattern. As can be seen, the flow response shows a sharp increase due to inflow, but also has a gradual recession due to groundwater infiltration.

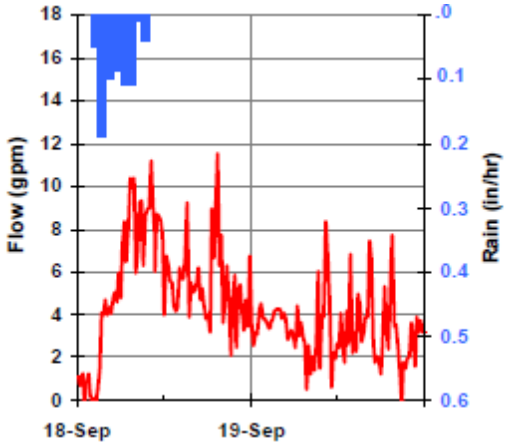


Figure No. 5 – Typical Inflow and Infiltration Combination Chart Response Pattern

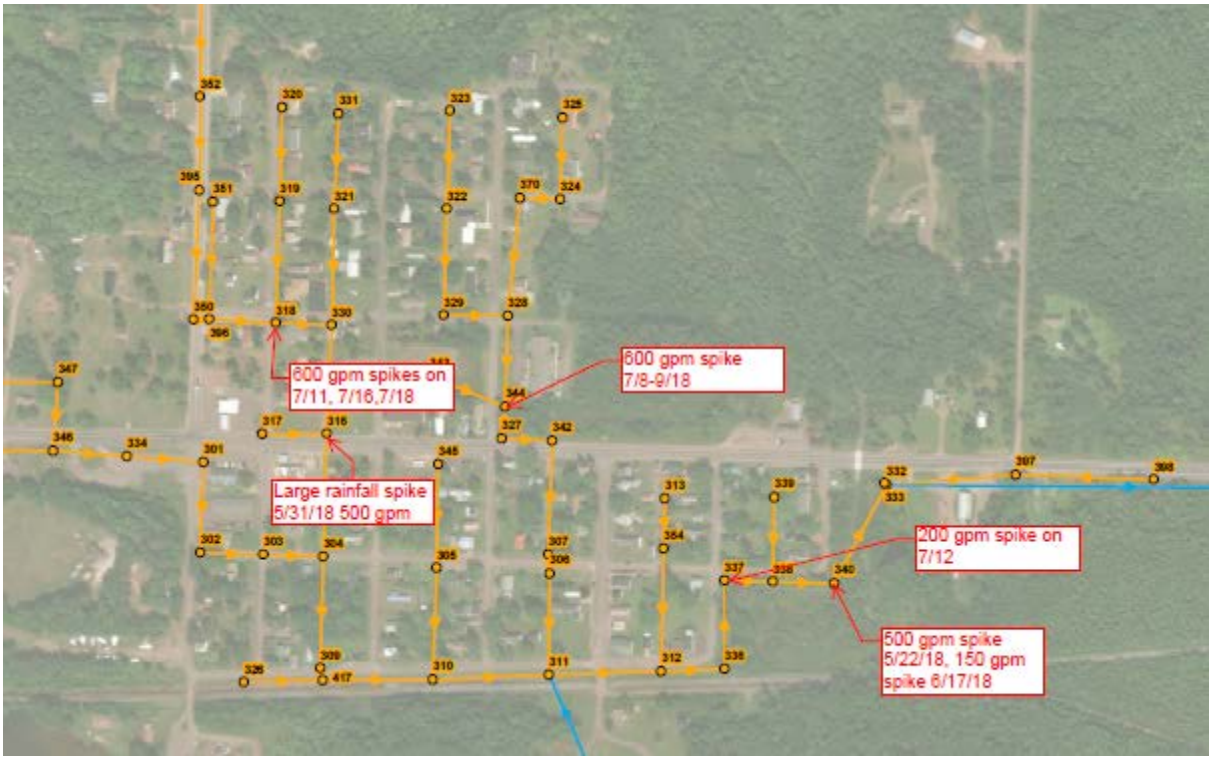
Peaking Factor

A value often used in deciding if storm water infiltration is present is called a peaking factor. The peaking factor is normally a ratio between the average flows to the peak flow of a system. As flow is always changing in wastewater sewers, every system has a peaking factor. Ideally the peaking factor is kept within a range of about 3-8, therefore, if the peaking factor is higher or lower it is often due to excess water entering or leaving the system.

Since only flow amounts are being used as a flow indicator for this project, peaking factors will be based on water flow volume.

2.0 FLOW MONITORING

The flow metering that was done in the summer of 2018 had fairly good results. For a system of this age, the results were pretty favorable in that the amount of I&I from rainfall events produced



a few spikes in flows, but the order of magnitude of those spikes was relatively nominal compared to what other communities in the area are seeing. The peaking factors were around 4-6 (4 to 6 times the average flow). While these additional flows put more load onto the sewage lagoons, the peaks last a very short time period and go back down to base flow very quickly (within a few hours). Sometime, when ground water from rain events infiltrate into the system, these peaks will last for multiple days. This is not the case for Bergland. Thus, this inflows are likely through above ground sources such as roof drains, building floor drains, cross ties with storm sewers, abandoned laterals collecting water, etc.

3.0 RECOMMENDATIONS

The flow monitoring results, the Smoke testing incidents and the manhole inspections were all considered in developing the Asset Management Report Recommendations. Specifically, to the flow monitoring studies, the following action items are recommended:

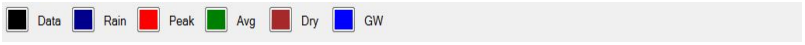
1) Enforce the Township's ordinances regarding not allowing stormwater and groundwater drains to be connected to the public sanitary sewer.

2) Continue investigating the areas of moderate and high concern as depicted in Figures E.3 and E.4 in Appendix E.1.

3) Fix defects in the manhole casting/chimney area that were found during smoke testing and manhole inspections. It is much more cost effective to prevent I&I from getting into the casting/chimney than to dig up a busy roadway to fix a defect in the pipe. See recommendations within the proposed Phase 5 Project located in section 7.1 of the Wastewater Asset Management Report.

Appendix E1

Flow Metering Results



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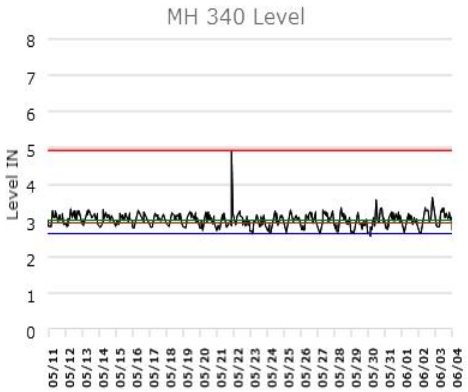

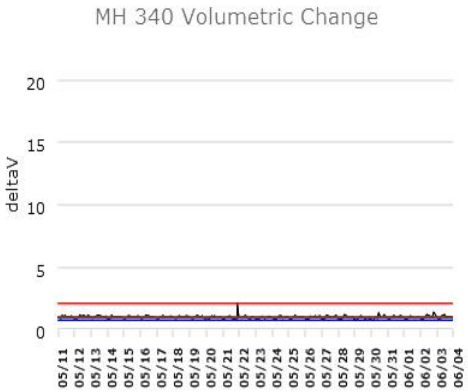

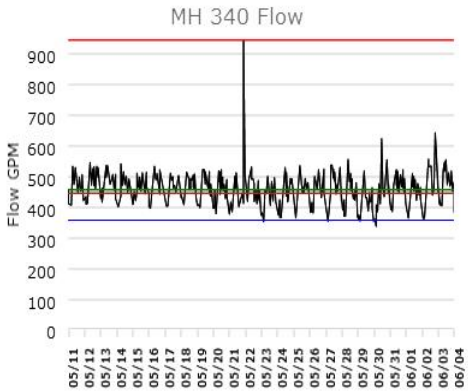

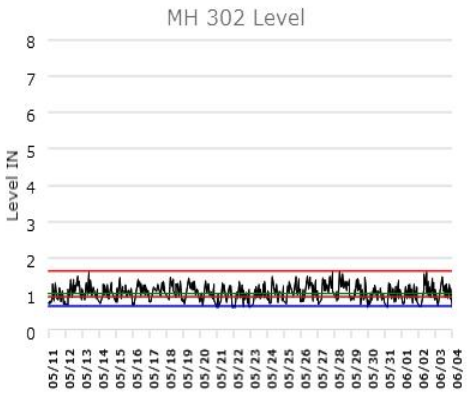

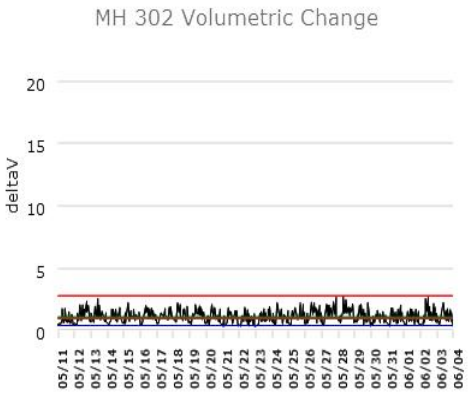

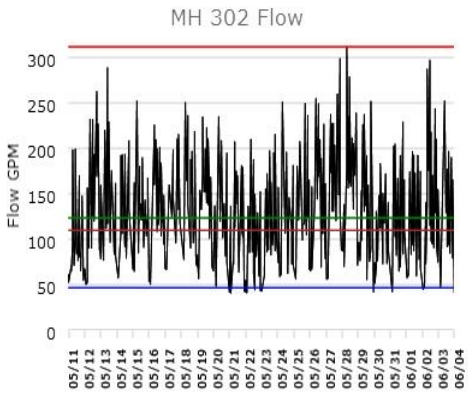

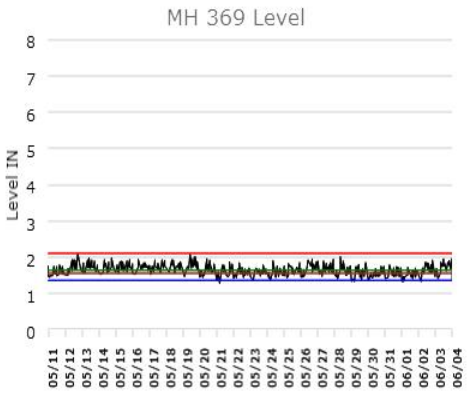
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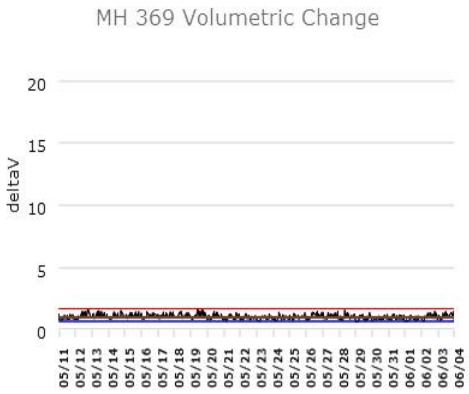
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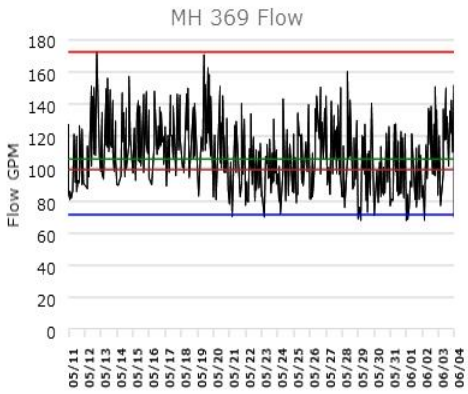
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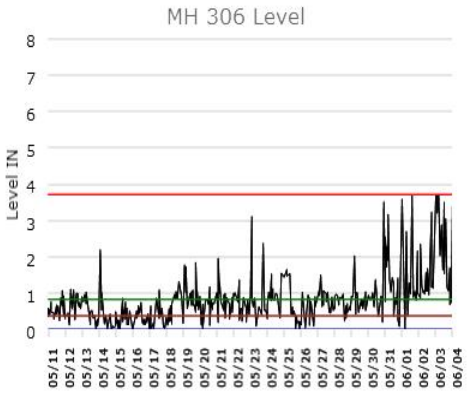
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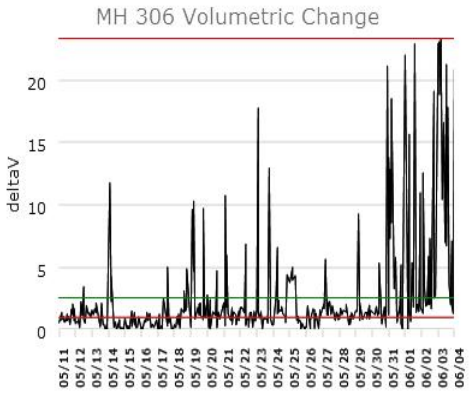
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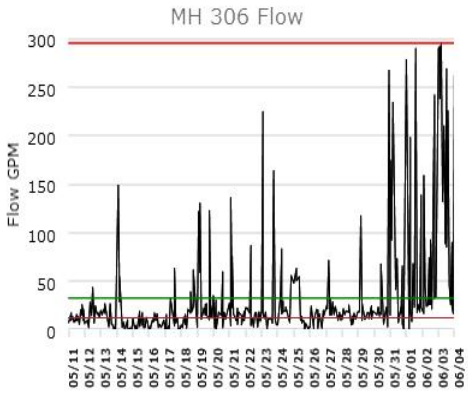
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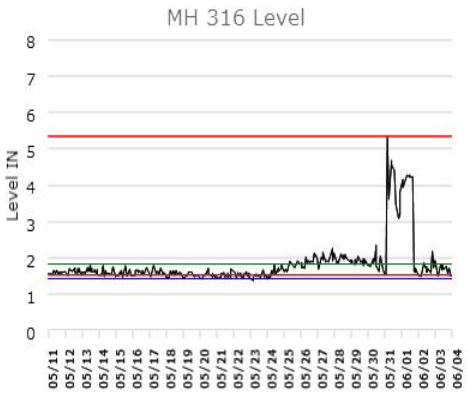
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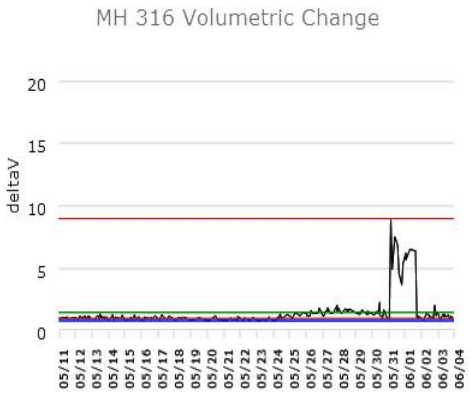
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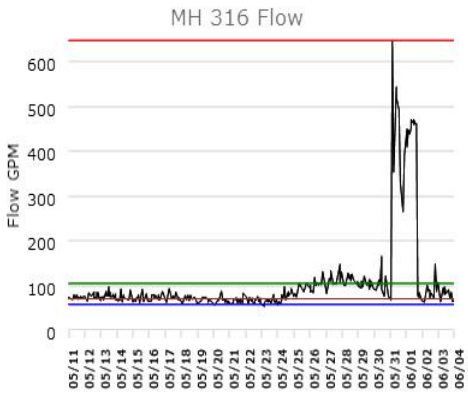
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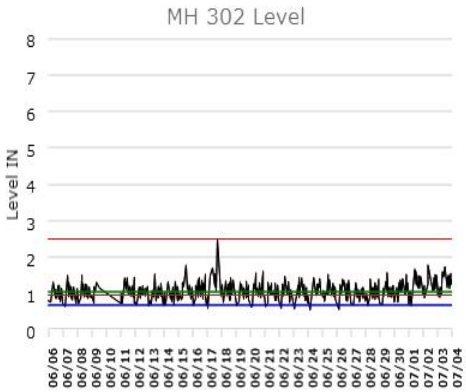

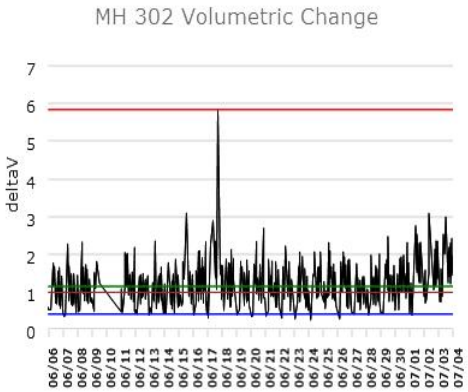

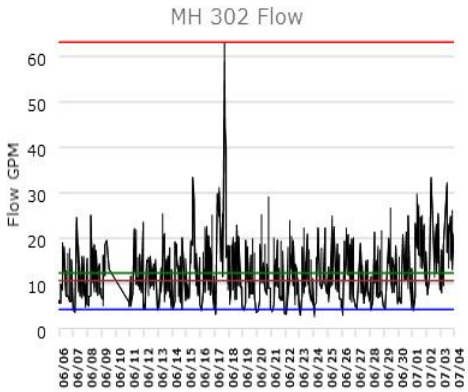

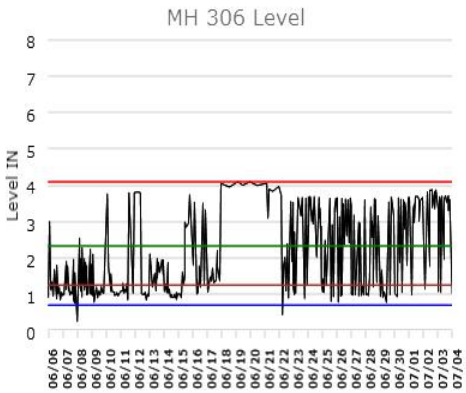

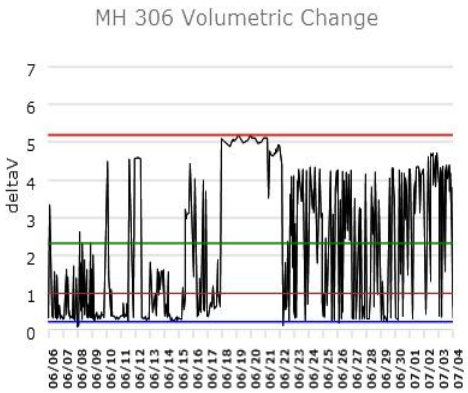

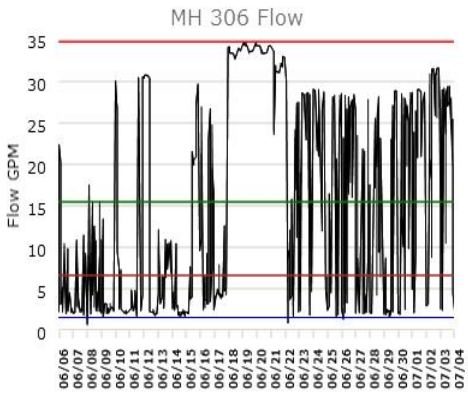

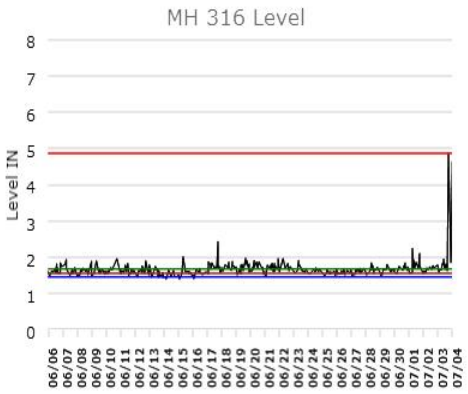
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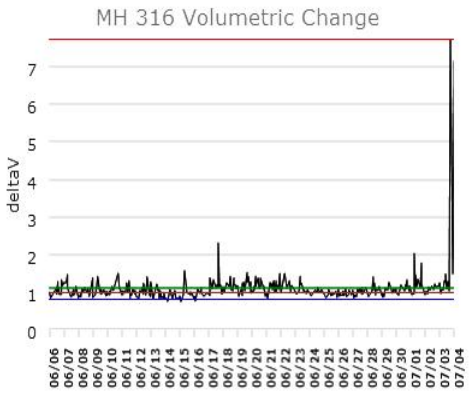
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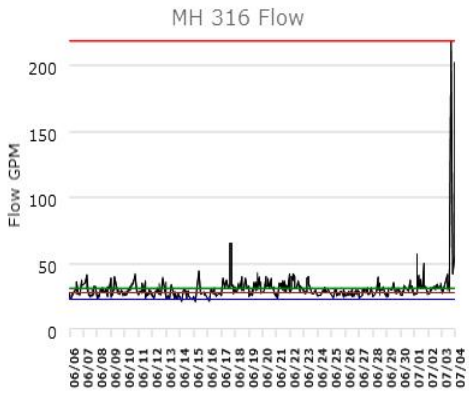
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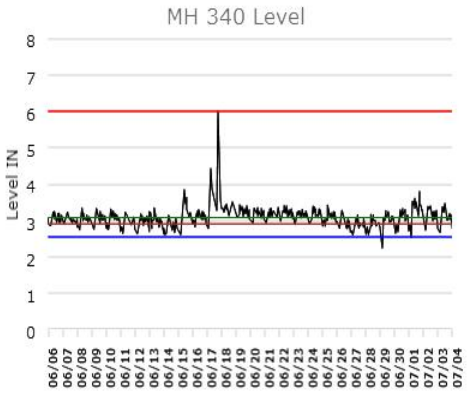
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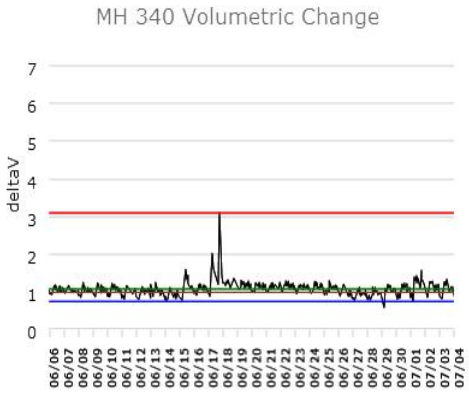
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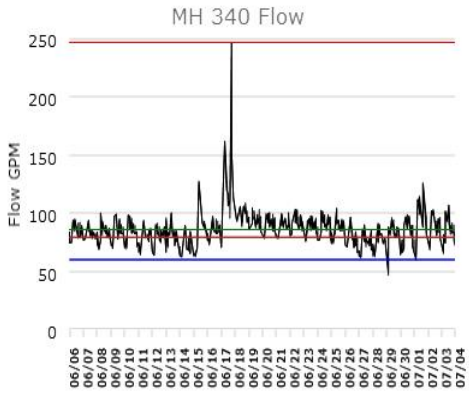
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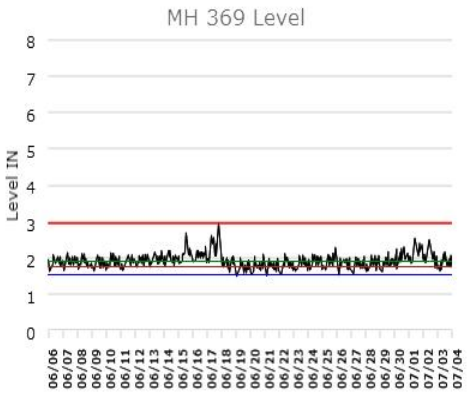
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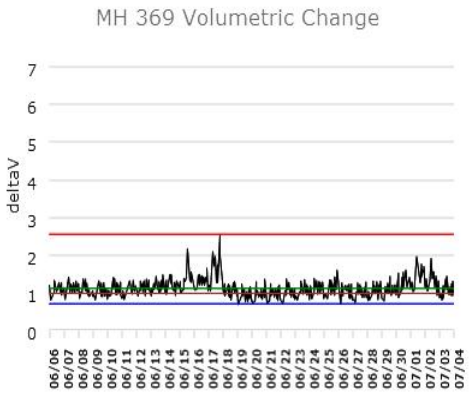
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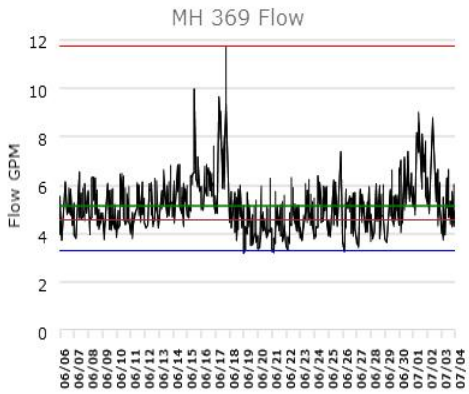
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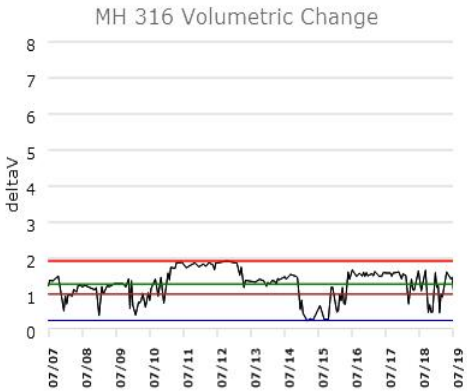

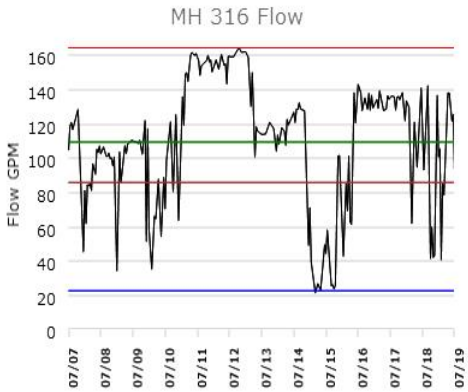

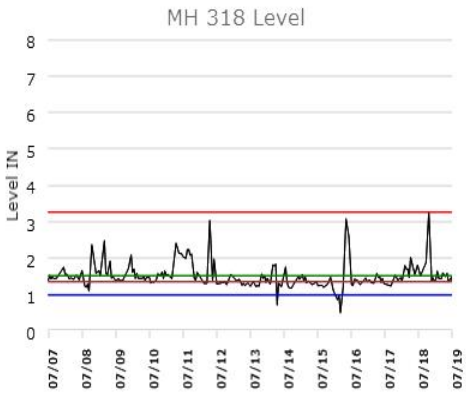

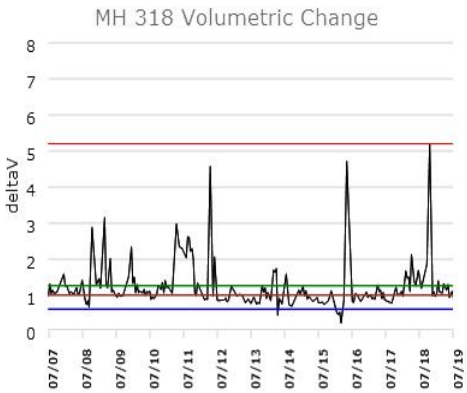

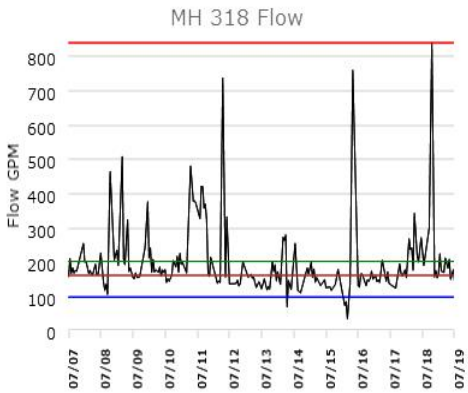

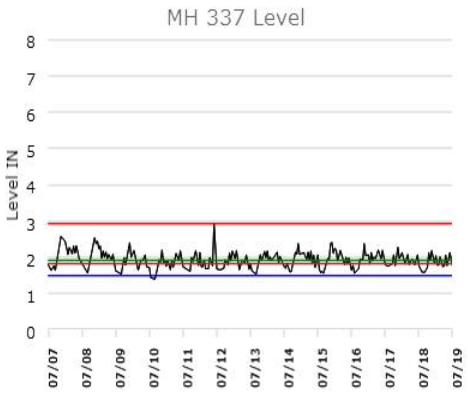
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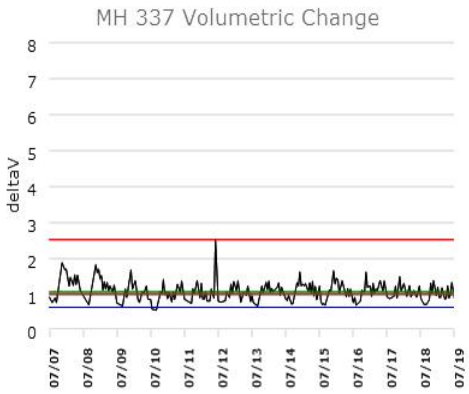
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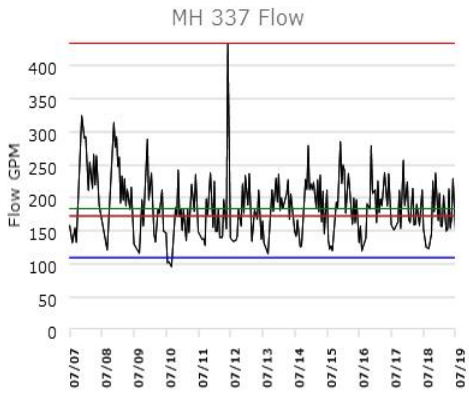
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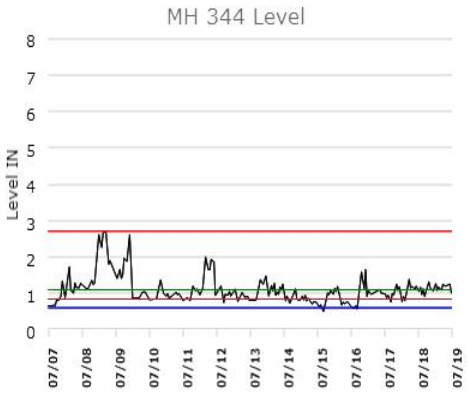
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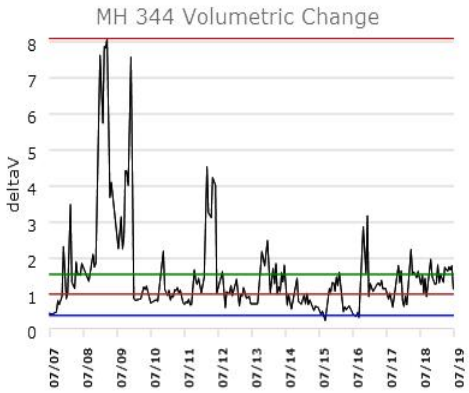
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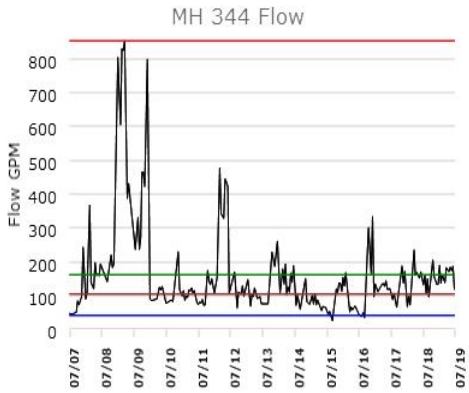
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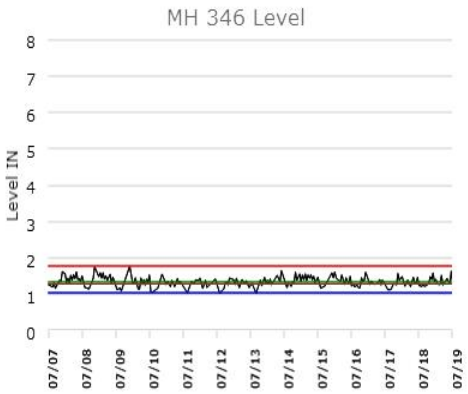
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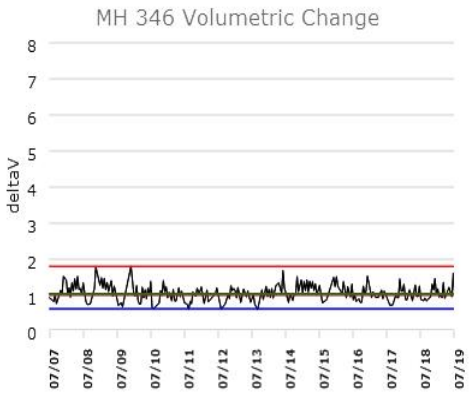
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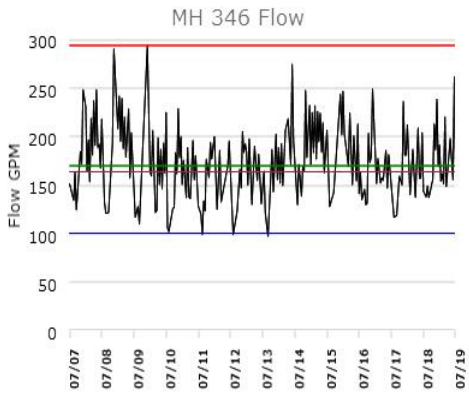
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APPENDIX E

LGASA PHASE I USDA FUNDING APPLICATION AND PRELIMINARY ENGINEERING REPORT

SUMMARY OF PROPOSED PROJECTS STUDIED ON WEST SHORE OF LAKE GOGEBIC

General: Bergland Township and LGASA originally instructed Coleman Engineering to study a large project encompassing both Counties on the west shore of Lake Gogebic. This is the project that was submitted to USDA Rural Development with a funding application and Preliminary Engineering Report. USDA RD came back with a list of comments for that project: the most important of which was that an income survey will be needed to prove that the project area is at poverty income level which would then quality for grants and poverty interest rates. At this point, LGASA decided it was not in their best interest to pay for this income survey because of the likelihood of an unfavorable result. At that point, Bergland Township asked Coleman Engineering to study some other smaller project options. CEC has come up with the following project options:

- **Project 1: The original project submitted to USDA RD**: 262 EDU's.
- **Project 2: Expansion for Maximum Lagoon Capacity**: 182 EDU's. This project would not require the need for a lagoon expansion, as it would go to the full capacity of the lagoon.
- **Project 3: Expansion to County Line**: 101 EDU's
- **Project 4: Expansion for very small project**: 20 EDU's

Monthly billing is based off Equivalent Domestic Units (EDUs), with each customer paying the same rate per EDU. Each residence (permanent dwellings and vacation homes) comprised one EDU per structure, regardless of water/sewer usage rates. Businesses and campgrounds generally consisted of multiple EDUs each. Thus, all residences pay the same rate each month, while businesses pay an increased amount due to their higher number of EDUs (based off their higher estimated water/sewer usage rates).

A summary of the projects and corresponding monthly user rates are on the following two pages. The pages after that are the detail of how we came up with the costs and rates.

4% Interest Rate **(This is the current market rate that would result from an unfavorable income survey.)**	0% grant, 100% Loan
Project 1: original plan, two counties (262 EDUs)	
Project Costs	$ 10,650,000
Rate per EDU per month	**$ 212**
Project 2: max. lagoon capacity (182 EDUs)	
Project Costs	$ 7,697,000
Rate per EDU per month	**$ 229**
Project 3: Project to county line (101 EDUs)	
Project Costs	$ 4,852,000
Rate per EDU per month	**$ 280**
Project 4: 20 users (20 EDUs)	
Project Costs	$ 1,317,000
Rate per EDU per month	**$ 576**

6% Interest Rate **(This is what the markey rate could potentially rise to in a few years. Market rate would result from an unfavorable income survey.)**	0% grant, 100% Loan
Project 1: original plan, two counties (262 EDUs)	
Project Costs	$ 11,002,000
Rate per EDU per month	**$ 279**
Project 2: max. lagoon capacity (182 EDUs)	
Project Costs	$ 7,951,000
Rate per EDU per month	**$ 299**
Project 3: Project to county line (101 EDUs)	
Project Costs	$ 5,012,000
Rate per EDU per month	**$ 359**
Project 4: 20 users (20 EDUs)	
Project Costs	$ 1,360,000
Rate per EDU per month	**$ 684**

Bergland Township & LGASA Project Options, Continued

2.375% Interest Rate (This is the current poverty rate. Would need favorable income survey to qualify for this poverty rate.)	Grant Scenario			
	0% grant	25% grant	50% grant	75% grant
Project 1: original plan, two counties (262 EDUs)				
Project Costs	$ 10,381,000	$ 7,786,000	$ 5,191,000	$ 2,596,000
Rate per EDU per month	**$ 166**	**$ 130**	**$ 93**	**$ 57**
Project 2: max. lagoon capacity (182 EDUs)				
Project Costs	$ 7,502,000	$ 5,627,000	$ 3,751,000	$ 1,876,000
Rate per EDU per month	**$ 181**	**$ 143**	**$ 105**	**$ 67**
Project 3: Project to county line (101 EDUs)				
Project Costs	$ 4,729,000	$ 3,547,000	$ 2,365,000	$ 1,183,000
Rate per EDU per month	**$ 225**	**$ 182**	**$ 139**	**$ 95**
Project 4: 20 users (20 EDUs)				
Project Costs	$ 1,284,000	$ 963,000	$ 642,000	$ 321,000
Rate per EDU per month	**$ 501**	**$ 442**	**$ 382**	**$ 323**

3% Interest Rate (This is what the poverty rate could potentially rise to in a few years. Would need a favorable income survey to qualify for the poverty rate.)	Grant Scenario			
	0% grant	25% grant	50% grant	75% grant
Project 1: original plan, two counties (262 EDUs)				
Project Costs	$ 10,483,000	$ 7,863,000	$ 5,242,000	$ 2,621,000
Rate per EDU per month	**$ 183**	**$ 142**	**$ 102**	**$ 61**
Project 2: max. lagoon capacity (182 EDUs)				
Project Costs	$ 7,576,000	$ 5,682,000	$ 3,788,000	$ 1,894,000
Rate per EDU per month	**$ 199**	**$ 156**	**$ 114**	**$ 71**
Project 3: Project to county line (101 EDUs)				
Project Costs	$ 4,775,000	$ 3,582,000	$ 2,388,000	$ 1,194,000
Rate per EDU per month	**$ 245**	**$ 197**	**$ 149**	**$ 100**
Project 4: 20 users (20 EDUs)				
Project Costs	$ 1,296,000	$ 972,000	$ 648,000	$ 324,000
Rate per EDU per month	**$ 528**	**$ 462**	**$ 396**	**$ 330**

Project 1: Original LGASA Project: The full project consisted of 262 Equivalent Domestic Units (EDUs). The project would terminate at Gogebic Lodge, resulting in 7.8 miles of sewerage between Ontonagon County Park and the Gogebic Lodge. The cost of the project (not including capitalized loan interest) was estimated at $10,011,000. Factoring in capitalized interest for various interest rates will result in a final project cost that ranges between $10,381,000 (2.375% interest) and $11,002,000 (6.00% interest). The cost per EDU per month ranges between $166 and $280, respectively. As with each version of the project plan, the cost per EDU could potentially be reduced if grant funding were made available. Figure 1 below shows the cost estimate, while Figures 2-5 on the following pages shows the funding and rate structure breakdown for various loan interest amounts and various potential grant amounts.

Figure 1. Full Project Cost Estimate

Item Number	Description	Unit	Quantity	Unit Price	Extension
1	1.5-inch HDPE Force Main	Lineal Foot	1700	$ 17.00	$ 28,900.00
2	2-inch HDPE Force Main	Lineal Foot	700	$ 18.00	$ 12,600.00
3	3-inch HDPE Force Main	Lineal Foot	2300	$ 23.00	$ 52,900.00
4	4-inch HDPE Force Main	Lineal Foot	5450	$ 23.50	$ 128,075.00
5	5-inch HDPE Force Main	Lineal Foot	14010	$ 25.15	$ 352,351.50
6	6-inch HDPE Force Main	Lineal Foot	29660	$ 25.15	$ 745,949.00
7	1.5-inch Gate Valve and Box	Each	3	$ 455.00	$ 1,365.00
8	2-inch Gate Valve and Box	Each	1	$ 530.00	$ 530.00
9	3-inch Gate Valve and Box	Each	2	$ 1,300.00	$ 2,600.00
10	4-inch Gate Valve and Box	Each	3	$ 1,430.00	$ 4,290.00
11	5-inch Gate Valve and Box	Each	6	$ 1,750.00	$ 10,500.00
12	6-inch Gate Valve and Box	Each	10	$ 1,750.00	$ 17,500.00
13	Grinder Pump Station	Each	230	$ 4,515.00	$ 1,038,450.00
14	Electrical Connection	Lineal Foot	10000	$ 7.50	$ 75,000.00
15	Air Relief and Flushing Station	Each	32	$ 4,640.00	$ 148,480.00
16	Flushing Station	Each	40	$ 3,125.00	$ 125,000.00
17	1.25-inch HDPE Service Force Main	Lineal Foot	78850	$ 35.00	$ 2,759,750.00
18	1.25-inch HDPE Service Force Main - 80 Feet-Bored Under M-64	Each	11	$ 4,400.00	$ 48,400.00
19	Connect to Existing Lift Station	Each	1	$ 7,000.00	$ 7,000.00
20	Jack & Bore Railroad Crossing - Hoop & Holler Road	Lump Sum	1	$ 10,450.00	$ 10,450.00
21	Rock Excavation	Cubic Yd	1500	$ 125.00	$ 187,500.00
22	Special Backfill	Cubic Yd	1500	$ 9.00	$ 13,500.00
23	Stone Refill (MDOT 6A)	Cubic Yd	500	$ 28.00	$ 14,000.00
24	Erosion Control	Lump Sum	1	$ 48,000.00	$ 48,000.00
25	Utility Exploration	Each	25	$ 400.00	$ 10,000.00
26	Service Line Connection (Fused Saddle Tap)	Each	230	$ 1,100.00	$ 253,000.00
27	Tee Connection (Less than 3-inch)	Each	3	$ 850.00	$ 2,550.00
28	Spare "Pump Core" Units	Each	5	$ 1,400.00	$ 7,000.00
29	Asphalt Pavement (330#/syd 13A)	Sq. Yard	250	$ 20.00	$ 5,000.00
30	8 inches of MDOT 23A Gravel	Sq. Yard	15000	$ 7.00	$ 105,000.00
31	8 inches of MDOT 22A Gravel	Sq. Yard	250	$ 7.00	$ 1,750.00
32	Clearing	Acre	8.0	$ 6,500.00	$ 52,000.00
33	Earth Excavation / placement	Cubic Yd	20600	$ 7.00	$ 144,200.00
34	Liner	Sq. Yard	18000	$ 4.00	$ 72,000.00
35	Sand Cover	Cubic Yd	6000	$ 11.00	$ 66,000.00
36	Lift Station	Each	2	$ 226,800.00	$ 453,600.00
37	Lagoon Cell	Lump Sum	1	$ 516,000.00	$ 516,000.00
38	Land for Lagoon Cell	Acre	5.5	$ 1,000.00	$ 5,500.00
39	Monitoring Wells	Each	3	$ 5,500.00	$ 16,500.00
40	Topsoil	Cubic Yd	1725	$ 20.00	$ 34,500.00
41	Restoration	Lump Sum	1	$ 90,000.00	$ 90,000.00
42	Roadway Gravel	Cubic Yd	200	$ 20.00	$ 4,000.00
43	Fencing	Lineal Foot	2000	$ 20.00	$ 40,000.00
	Estimated Direct Construction				$ 7,711,690.50
	Contingencies (10%)				$ 771,169.05
	Engineering (18%)				$ 1,388,104.29
	Admin / Legal (lots of Easements)				$ 140,000.00
	Estimated Construction Total				$ 10,010,963.84

Figure 2. User Charge Analysis, Full Project, 2.375% Interest Rate (Current Poverty Rate)

CAPITAL COSTS (1)	Percent Grant 0%	25%	50%	75%
CONSTRUCTION	$7,711,691	$7,711,691	$7,711,691	$7,711,691
ENGINEERING, LEGAL, ADMINISTRATION, LAND, EASEMENTS, CONTINGENCIES, ETC.	$2,299,273	$2,299,273	$2,299,273	$2,299,273
CONSTRUCTION TOTAL	$10,010,964	$10,010,964	$10,010,964	$10,010,964
CAPITALIZED INTEREST	$369,823	$277,376	$184,929	$92,483
TOTAL FUNDS NEEDED	$10,380,787	$10,288,340	$10,195,893	$10,103,446
GRANT/LOAN AMOUNTS				
GRANT	$0	$2,502,741	$5,005,482	$7,508,223
Loan Funding Needed for Construction:	$10,380,787	$7,785,599	$5,190,411	$2,595,223
Principal from Bond (round to nearest $1000):	$10,381,000	$7,786,000	$5,191,000	$2,596,000
EDUs NEW SYSTEM	262	262	262	262
MONTHLY CHARGE PER EDU	$166.15	$129.62	$93.08	$56.54

Figure 3. User Charge Analysis, Full Project, 3% Interest Rate (Potential Future Poverty Rate)

CAPITAL COSTS (1)	Percent Grant 0%	25%	50%	75%
CONSTRUCTION	$7,711,691	$7,711,691	$7,711,691	$7,711,691
ENGINEERING, LEGAL, ADMINISTRATION, LAND, EASEMENTS, CONTINGENCIES, ETC.	$2,299,273	$2,299,273	$2,299,273	$2,299,273
CONSTRUCTION TOTAL	$10,010,964	$10,010,964	$10,010,964	$10,010,964
CAPITALIZED INTEREST	$471,735	$353,835	$235,890	$117,945
TOTAL FUNDS NEEDED	$10,482,699	$10,364,799	$10,246,854	$10,128,909
GRANT/LOAN AMOUNTS				
GRANT	$0	$2,502,741	$5,005,482	$7,508,223
Loan Funding Needed for Construction:	$10,482,699	$7,862,058	$5,241,372	$2,620,686
Principal from Bond (round to nearest $1000):	$10,483,000	$7,863,000	$5,242,000	$2,621,000
EDUs NEW SYSTEM	262	262	262	262
MONTHLY CHARGE PER EDU	$183.05	$142.30	$101.53	$60.76

Figure 4. User Charge Analysis, Full Project, 4% Interest Rate (Current Market Rate)

CAPITAL COSTS (1)	Percent Grant 0%	25%	50%	75%
CONSTRUCTION	$7,711,691	$7,711,691	$7,711,691	$7,711,691
ENGINEERING, LEGAL, ADMINISTRATION, LAND, EASEMENTS, CONTINGENCIES, ETC.	$2,299,273	$2,299,273	$2,299,273	$2,299,273
CONSTRUCTION TOTAL	$10,010,964	$10,010,964	$10,010,964	$10,010,964
CAPITALIZED INTEREST	$639,000	$479,280	$319,500	$159,780
TOTAL FUNDS NEEDED	$10,649,964	$10,490,244	$10,330,464	$10,170,744
GRANT/LOAN AMOUNTS				
GRANT	$0	$2,502,741	$5,005,482	$7,508,223
Loan Funding Needed for Construction:	$10,649,964	$7,987,503	$5,324,982	$2,662,521
Principal from Bond (round to nearest $1000):	$10,650,000	$7,988,000	$5,325,000	$2,663,000
EDUs NEW SYSTEM	262	262	262	262
MONTHLY CHARGE PER EDU	$212.37	$164.29	$116.18	$68.09

Figure 5. User Charge Analysis, Full Project, 6% Interest Rate (Potential Future Market Rate)

CAPITAL COSTS (1)	Percent Grant 0%	25%	50%	75%
CONSTRUCTION	$7,711,691	$7,711,691	$7,711,691	$7,711,691
ENGINEERING, LEGAL, ADMINISTRATION, LAND, EASEMENTS, CONTINGENCIES, ETC.	$2,299,273	$2,299,273	$2,299,273	$2,299,273
CONSTRUCTION TOTAL	$10,010,964	$10,010,964	$10,010,964	$10,010,964
CAPITALIZED INTEREST	$990,180	$742,590	$495,090	$247,590
TOTAL FUNDS NEEDED	$11,001,144	$10,753,554	$10,506,054	$10,258,554
GRANT/LOAN AMOUNTS				
GRANT	$0	$2,502,741	$5,005,482	$7,508,223
Loan Funding Needed for Construction:	$11,001,144	$8,250,813	$5,500,572	$2,750,331
Principal from Bond (round to nearest $1000):	$11,002,000	$8,251,000	$5,501,000	$2,751,000
EDUs NEW SYSTEM	262	262	262	262
MONTHLY CHARGE PER EDU	$279.27	$214.44	$149.63	$84.82

Project 2: Project for Maximum Lagoon Capacity: This version consisted of 182 EDUs in order to maximize the existing lagoon capacity without needing to construct additional lagoon cells. The project would result in 5.3 miles of sewerage from Ontonagon County Park to Pabst Bay. The cost of the project (not including capitalized interest) was estimated at $7,235,000. Factoring in capitalized interest for various interest rates will result in a final project cost that ranges between $7,502,000 (2.375% interest) and $7,951,000 (6.00% interest). The cost per EDU per month ranges between $181 and $299, respectively. Figure 6 below shows the cost estimate, while Figures 7-10 on the following pages shows the funding and rate structure breakdown.

Figure 6. Cost Estimate for Maximum Lagoon Capacity Project

Item Number	Description	Unit	Quantity	Unit Price	Extension
1	1.5-inch HDPE Force Main	Lineal Foot	1400	$ 17.00	$ 23,800.00
2	2-inch HDPE Force Main	Lineal Foot	1900	$ 18.00	$ 34,200.00
3	3-inch HDPE Force Main	Lineal Foot	1450	$ 23.00	$ 33,350.00
4	4-inch HDPE Force Main	Lineal Foot	5360	$ 23.50	$ 125,960.00
5	5-inch HDPE Force Main	Lineal Foot	12250	$ 25.15	$ 308,087.50
6	6-inch HDPE Force Main	Lineal Foot	17410	$ 25.15	$ 437,861.50
7	1.5-inch Gate Valve and Box	Each	3	$ 455.00	$ 1,365.00
8	2-inch Gate Valve and Box	Each	1	$ 530.00	$ 530.00
9	3-inch Gate Valve and Box	Each	2	$ 1,300.00	$ 2,600.00
10	4-inch Gate Valve and Box	Each	2	$ 1,430.00	$ 2,860.00
11	5-inch Gate Valve and Box	Each	4	$ 1,750.00	$ 7,000.00
12	6-inch Gate Valve and Box	Each	6	$ 1,750.00	$ 10,500.00
13	Grinder Pump Station	Each	182	$ 4,515.00	$ 821,730.00
14	Electrical Connection	Lineal Foot	7500	$ 7.50	$ 56,250.00
15	Air Relief and Flushing Station	Each	24	$ 4,640.00	$ 111,360.00
16	Flushing Station	Each	30	$ 3,125.00	$ 93,750.00
17	1.25-inch HDPE Service Force Main	Lineal Foot	59140	$ 35.00	$ 2,069,900.00
18	1.25-inch HDPE Service Force Main - 80 Feet-Bored Under M-64	Each	9	$ 4,400.00	$ 39,600.00
19	Connect to Existing Lift Station	Each	1	$ 7,000.00	$ 7,000.00
20	Jack & Bore Railroad Crossing - Hoop & Holler Road	Lump Sum	1	$ 10,450.00	$ 10,450.00
21	Rock Excavation	Cubic Yd	1125	$ 125.00	$ 140,625.00
22	Special Backfill	Cubic Yd	1125	$ 9.00	$ 10,125.00
23	Stone Refill (MDOT 6A)	Cubic Yd	325	$ 28.00	$ 9,100.00
24	Erosion Control	Lump Sum	0.75	$ 48,000.00	$ 36,000.00
25	Utility Exploration	Each	20	$ 400.00	$ 8,000.00
26	Service Line Connection (Fused Saddle Tap)	Each	182	$ 1,100.00	$ 200,200.00
27	Tee Connection (Less than 3-inch)	Each	3	$ 850.00	$ 2,550.00
28	Spare "Pump Core" Units	Each	4	$ 1,400.00	$ 5,600.00
29	Asphalt Pavement (330#/syd 13A)	Sq. Yard	200	$ 20.00	$ 4,000.00
30	8 inches of MDOT 23A Gravel	Sq. Yard	11250	$ 7.00	$ 78,750.00
31	8 inches of MDOT 22A Gravel	Sq. Yard	200	$ 7.00	$ 1,400.00
32	Clearing	Acre	6.0	$ 6,500.00	$ 39,000.00
33	Earth Excavation / placement	Cubic Yd	15000	$ 7.00	$ 105,000.00
34	Liner	Sq. Yard	13500	$ 4.00	$ 54,000.00
35	Sand Cover	Cubic Yd	4500	$ 11.00	$ 49,500.00
36	Lift Station	Each	2	$ 226,800.00	$ 453,600.00
37	Lagoon Cell	Lump Sum		$ 516,000.00	$ -
38	Land for Lagoon Cell	Acre		$ 1,000.00	$ -
39	Monitoring Wells	Each	3	$ 5,500.00	$ 16,500.00
40	Topsoil	Cubic Yd	1500	$ 20.00	$ 30,000.00
41	Restoration	Lump Sum	0.75	$ 90,000.00	$ 67,500.00
42	Roadway Gravel	Cubic Yd	150	$ 20.00	$ 3,000.00
43	Fencing	Lineal Foot	1500	$ 20.00	$ 30,000.00
	Estimated Direct Construction				$ 5,542,604.00
	Contingencies (10%)				$ 554,260.40
	Engineering (18%)				$ 997,668.72
	Admin / Legal (lots of Easements)				$ 140,000.00
	Estimated Construction Total				$ 7,234,533.12

Figure 7. User Charge Analysis, Max. Lagoon Capacity, 2.375% Interest

	Percent Grant			
CAPITAL COSTS (1)	0%	25%	50%	75%
CONSTRUCTION	$5,542,604	$5,542,604	$5,542,604	$5,542,604
ENGINEERING, LEGAL, ADMINISTRATION, EASEMENTS, CONTINGENCIES, ETC.	$1,691,929	$1,691,929	$1,691,929	$1,691,929
CONSTRUCTION TOTAL	$7,234,533	$7,234,533	$7,234,533	$7,234,533
CAPITALIZED INTEREST	$267,259	$200,462	$133,629	$66,833
TOTAL FUNDS NEEDED	$7,501,792	$7,434,995	$7,368,162	$7,301,366
GRANT/LOAN AMOUNTS				
GRANT	$0	$1,808,633	$3,617,267	$5,425,900
Loan Funding Needed for Construction:	$7,501,792	$5,626,362	$3,750,896	$1,875,466
Principal from Bond (round to nearest $1000):	$7,502,000	$5,627,000	$3,751,000	$1,876,000
EDUs NEW SYSTEM	182	182	182	182
MONTHLY CHARGE PER EDU	$181.07	$143.06	$105.04	$67.03

Figure 8. User Charge Analysis, Max. Lagoon Capacity, 3% Interest

	Percent Grant			
CAPITAL COSTS (1)	0%	25%	50%	75%
CONSTRUCTION	$5,542,604	$5,542,604	$5,542,604	$5,542,604
ENGINEERING, LEGAL, ADMINISTRATION, EASEMENTS, CONTINGENCIES, ETC.	$1,691,929	$1,691,929	$1,691,929	$1,691,929
CONSTRUCTION TOTAL	$7,234,533	$7,234,533	$7,234,533	$7,234,533
CAPITALIZED INTEREST	$340,920	$255,690	$170,460	$85,230
TOTAL FUNDS NEEDED	$7,575,453	$7,490,223	$7,404,993	$7,319,763
GRANT/LOAN AMOUNTS				
GRANT	$0	$1,808,633	$3,617,267	$5,425,900
Loan Funding Needed for Construction:	$7,575,453	$5,681,590	$3,787,727	$1,893,863
Principal from Bond (round to nearest $1000):	$7,576,000	$5,682,000	$3,788,000	$1,894,000
EDUs NEW SYSTEM	182	182	182	182
MONTHLY CHARGE PER EDU	$198.65	$156.24	$113.83	$71.42

Figure 9. User Charge Analysis, Max. Lagoon Capacity, 4% Interest

	Percent Grant			
CAPITAL COSTS (1)	0%	25%	50%	75%
CONSTRUCTION	$5,542,604	$5,542,604	$5,542,604	$5,542,604
ENGINEERING, LEGAL, ADMINISTRATION, EASEMENTS, CONTINGENCIES, ETC.	$1,691,929	$1,691,929	$1,691,929	$1,691,929
CONSTRUCTION TOTAL	$7,234,533	$7,234,533	$7,234,533	$7,234,533
CAPITALIZED INTEREST	$461,820	$346,380	$230,940	$115,500
TOTAL FUNDS NEEDED	$7,696,353	$7,580,913	$7,465,473	$7,350,033
GRANT/LOAN AMOUNTS				
GRANT	$0	$1,808,633	$3,617,267	$5,425,900
Loan Funding Needed for Construction:	$7,696,353	$5,772,280	$3,848,207	$1,924,133
Principal from Bond (round to nearest $1000):	$7,697,000	$5,773,000	$3,849,000	$1,925,000
EDUs NEW SYSTEM	182	182	182	182
MONTHLY CHARGE PER EDU	$229.17	$179.13	$129.10	$79.07

Figure 10. User Charge Analysis, Max. Lagoon Capacity, 6% Interest

	Percent Grant			
CAPITAL COSTS (1)	0%	25%	50%	75%
CONSTRUCTION	$5,542,604	$5,542,604	$5,542,604	$5,542,604
ENGINEERING, LEGAL, ADMINISTRATION, EASEMENTS, CONTINGENCIES, ETC.	$1,691,929	$1,691,929	$1,691,929	$1,691,929
CONSTRUCTION TOTAL	$7,234,533	$7,234,533	$7,234,533	$7,234,533
CAPITALIZED INTEREST	$715,590	$536,670	$357,840	$178,920
TOTAL FUNDS NEEDED	$7,950,123	$7,771,203	$7,592,373	$7,413,453
GRANT/LOAN AMOUNTS				
GRANT	$0	$1,808,633	$3,617,267	$5,425,900
Loan Funding Needed for Construction:	$7,950,123	$5,962,570	$3,975,107	$1,987,553
Principal from Bond (round to nearest $1000):	$7,951,000	$5,963,000	$3,976,000	$1,988,000
EDUs NEW SYSTEM	182	182	182	182
MONTHLY CHARGE PER EDU	$298.75	$231.31	$163.90	$96.45

Project 3: Project to County Line: This version consisted of 101 EDUs, with the project terminating at the County line. The project would result in 2.7 miles of sewerage from Ontonagon County Park to the County line. The cost of the project (not including capitalized interest) was estimated at $4,560,000. Factoring in capitalized interest for various interest rates will result in a final project cost that ranges between $4,729,000 (2.375% interest) and $5,012,000 (6.00% interest). The cost per EDU per month ranges between $225 and $359, respectively. Figure 11 below shows the cost estimate, while Figures 12-15 on the following pages shows the funding and rate structure breakdown.

Figure 11. Cost Estimate for Project to County Line

Item Number	Description	Unit	Quantity	Unit Price	Extension
1	1.5-inch HDPE Force Main	Lineal Foot	800	$ 17.00	$ 13,600.00
2	2-inch HDPE Force Main	Lineal Foot	3300	$ 18.00	$ 59,400.00
3	3-inch HDPE Force Main	Lineal Foot	4050	$ 23.00	$ 93,150.00
4	4-inch HDPE Force Main	Lineal Foot	3640	$ 23.50	$ 85,540.00
5	5-inch HDPE Force Main	Lineal Foot		$ 25.15	$ -
6	6-inch HDPE Force Main	Lineal Foot	13770	$ 25.15	$ 346,315.50
7	1.5-inch Gate Valve and Box	Each	3	$ 455.00	$ 1,365.00
8	2-inch Gate Valve and Box	Each	1	$ 530.00	$ 530.00
9	3-inch Gate Valve and Box	Each	2	$ 1,300.00	$ 2,600.00
10	4-inch Gate Valve and Box	Each	3	$ 1,430.00	$ 4,290.00
11	5-inch Gate Valve and Box	Each		$ 1,750.00	$ -
12	6-inch Gate Valve and Box	Each	5	$ 1,750.00	$ 8,750.00
13	Grinder Pump Station	Each	101	$ 4,515.00	$ 456,015.00
14	Electrical Connection	Lineal Foot	5000	$ 7.50	$ 37,500.00
15	Air Relief and Flushing Station	Each	16	$ 4,640.00	$ 74,240.00
16	Flushing Station	Each	20	$ 3,125.00	$ 62,500.00
17	1.25-inch HDPE Service Force Main	Lineal Foot	39425	$ 35.00	$ 1,379,875.00
18	1.25-inch HDPE Service Force Main - 80 Feet-Bored Under M-64	Each	1	$ 4,400.00	$ 4,400.00
19	Connect to Existing Lift Station	Each	1	$ 7,000.00	$ 7,000.00
20	Jack & Bore Railroad Crossing - Hoop & Holler Road	Lump Sum	1	$ 10,450.00	$ 10,450.00
21	Rock Excavation	Cubic Yd	750	$ 125.00	$ 93,750.00
22	Special Backfill	Cubic Yd	750	$ 9.00	$ 6,750.00
23	Stone Refill (MDOT 6A)	Cubic Yd	250	$ 28.00	$ 7,000.00
24	Erosion Control	Lump Sum	0.5	$ 48,000.00	$ 24,000.00
25	Utility Exploration	Each	15	$ 400.00	$ 6,000.00
26	Service Line Connection (Fused Saddle Tap)	Each	101	$ 1,100.00	$ 111,100.00
27	Tee Connection (Less than 3-inch)	Each	3	$ 850.00	$ 2,550.00
28	Spare "Pump Core" Units	Each	3	$ 1,400.00	$ 4,200.00
29	Asphalt Pavement (330#/syd 13A)	Sq. Yard	125	$ 20.00	$ 2,500.00
30	8 inches of MDOT 23A Gravel	Sq. Yard	7500	$ 7.00	$ 52,500.00
31	8 inches of MDOT 22A Gravel	Sq. Yard	125	$ 7.00	$ 875.00
32	Clearing	Acre	4.0	$ 6,500.00	$ 26,000.00
33	Earth Excavation / placement	Cubic Yd	10300	$ 7.00	$ 72,100.00
34	Liner	Sq. Yard	9000	$ 4.00	$ 36,000.00
35	Sand Cover	Cubic Yd	3000	$ 11.00	$ 33,000.00
36	Lift Station	Each	1	$ 226,800.00	$ 226,800.00
37	Lagoon Cell	Lump Sum		$ 516,000.00	$ -
38	Land for Lagoon Cell	Acre		$ 1,000.00	$ -
39	Monitoring Wells	Each	3	$ 5,500.00	$ 16,500.00
40	Topsoil	Cubic Yd	850	$ 20.00	$ 17,000.00
41	Restoration	Lump Sum	0.5	$ 90,000.00	$ 45,000.00
42	Roadway Gravel	Cubic Yd	100	$ 20.00	$ 2,000.00
43	Fencing	Lineal Foot	1000	$ 20.00	$ 20,000.00
	Estimated Direct Construction				$ 3,453,145.50
	Contingencies (10%)				$ 345,314.55
	Engineering (18%)				$ 621,566.19
	Admin / Legal (lots of Easements)				$ 140,000.00
	Estimated Construction Total				$ 4,560,026.24

Figure 12. User Charge Analysis, County Line Project, 2.375% Interest

	Percent Grant			
CAPITAL COSTS (1)	0%	25%	50%	75%
CONSTRUCTION	$3,453,146	$3,453,146	$3,453,146	$3,453,146
ENGINEERING, LEGAL, ADMINISTRATION, EASEMENTS, CONTINGENCIES, ETC.	$1,106,881	$1,106,881	$1,106,881	$1,106,881
CONSTRUCTION TOTAL	$4,560,026	$4,560,026	$4,560,026	$4,560,026
CAPITALIZED INTEREST	$168,471	$126,362	$84,253	$42,144
TOTAL FUNDS NEEDED	$4,728,497	$4,686,388	$4,644,279	$4,602,171
GRANT/LOAN AMOUNTS				
GRANT	$0	$1,140,007	$2,280,013	$3,420,020
Loan Funding Needed for Construction:	$4,728,497	$3,546,382	$2,364,266	$1,182,151
Principal from Bond (round to nearest $1000):	$4,729,000	$3,547,000	$2,365,000	$1,183,000
EDUs NEW SYSTEM	101	101	101	101
MONTHLY CHARGE PER EDU	$224.99	$181.82	$138.65	$95.48

Figure 13. User Charge Analysis, County Line Project, 3% Interest

	Percent Grant			
CAPITAL COSTS (1)	0%	25%	50%	75%
CONSTRUCTION	$3,453,146	$3,453,146	$3,453,146	$3,453,146
ENGINEERING, LEGAL, ADMINISTRATION, EASEMENTS, CONTINGENCIES, ETC.	$1,106,881	$1,106,881	$1,106,881	$1,106,881
CONSTRUCTION TOTAL	$4,560,026	$4,560,026	$4,560,026	$4,560,026
CAPITALIZED INTEREST	$214,875	$161,190	$107,460	$53,730
TOTAL FUNDS NEEDED	$4,774,901	$4,721,216	$4,667,486	$4,613,756
GRANT/LOAN AMOUNTS				
GRANT	$0	$1,140,007	$2,280,013	$3,420,020
Loan Funding Needed for Construction:	$4,774,901	$3,581,210	$2,387,473	$1,193,737
Principal from Bond (round to nearest $1000):	$4,775,000	$3,582,000	$2,388,000	$1,194,000
EDUs NEW SYSTEM	101	101	101	101
MONTHLY CHARGE PER EDU	$244.94	$196.80	$148.62	$100.44

Figure 14. User Charge Analysis, County Line Project, 4% Interest

	Percent Grant			
CAPITAL COSTS (1)	0%	25%	50%	75%
CONSTRUCTION	$3,453,146	$3,453,146	$3,453,146	$3,453,146
ENGINEERING, LEGAL, ADMINISTRATION, EASEMENTS, CONTINGENCIES, ETC.	$1,106,881	$1,106,881	$1,106,881	$1,106,881
CONSTRUCTION TOTAL	$4,560,026	$4,560,026	$4,560,026	$4,560,026
CAPITALIZED INTEREST	$291,120	$218,340	$145,560	$72,780
TOTAL FUNDS NEEDED	$4,851,146	$4,778,366	$4,705,586	$4,632,806
GRANT/LOAN AMOUNTS				
GRANT	$0	$1,140,007	$2,280,013	$3,420,020
Loan Funding Needed for Construction:	$4,851,146	$3,638,360	$2,425,573	$1,212,787
Principal from Bond (round to nearest $1000):	$4,852,000	$3,639,000	$2,426,000	$1,213,000
EDUs NEW SYSTEM	101	101	101	101
MONTHLY CHARGE PER EDU	$279.63	$222.79	$165.95	$109.11

Figure 15. User Charge Analysis, County Line Project, 6% Interest

	Percent Grant			
CAPITAL COSTS (1)	0%	25%	50%	75%
CONSTRUCTION	$3,453,146	$3,453,146	$3,453,146	$3,453,146
ENGINEERING, LEGAL, ADMINISTRATION, EASEMENTS, CONTINGENCIES, ETC.	$1,106,881	$1,106,881	$1,106,881	$1,106,881
CONSTRUCTION TOTAL	$4,560,026	$4,560,026	$4,560,026	$4,560,026
CAPITALIZED INTEREST	$451,080	$338,310	$225,540	$112,770
TOTAL FUNDS NEEDED	$5,011,106	$4,898,336	$4,785,566	$4,672,796
GRANT/LOAN AMOUNTS				
GRANT	$0	$1,140,007	$2,280,013	$3,420,020
Loan Funding Needed for Construction:	$5,011,106	$3,758,330	$2,505,553	$1,252,777
Principal from Bond (round to nearest $1000):	$5,012,000	$3,759,000	$2,506,000	$1,253,000
EDUs NEW SYSTEM	101	101	101	101
MONTHLY CHARGE PER EDU	$358.67	$282.07	$205.47	$128.87

Project 4: Project for 20 Users: This version consisted of 20 EDUs, with the project terminating approximately 0.75 miles south of Ontonagon County Park. The cost of the project (not including capitalized interest) was estimated at $1,237,600. Factoring in capitalized interest for various interest rates will result in a final project cost that ranges between $1,284,000 (2.375% interest) and $1,360,000 (6.00% interest). The cost per EDU per month ranges between $501 and $684, respectively. Figure 16 below shows the cost estimate, while Figures 17-20 on the following pages shows the funding and rate structure breakdown.

Figure 16. Cost Estimate for Project for 20 Users

Item Number	Description	Unit	Quantity	Unit Price	Extension
1	1.5-inch HDPE Force Main	Lineal Foot	800	$ 17.00	$ 13,600.00
2	2-inch HDPE Force Main	Lineal Foot	700	$ 18.00	$ 12,600.00
3	3-inch HDPE Force Main	Lineal Foot	12300	$ 23.00	$ 282,900.00
4	4-inch HDPE Force Main	Lineal Foot		$ 23.50	$ -
5	5-inch HDPE Force Main	Lineal Foot		$ 25.15	$ -
6	6-inch HDPE Force Main	Lineal Foot		$ 25.15	$ -
7	1.5-inch Gate Valve and Box	Each	1	$ 455.00	$ 455.00
8	2-inch Gate Valve and Box	Each	1	$ 530.00	$ 530.00
9	3-inch Gate Valve and Box	Each	1	$ 1,300.00	$ 1,300.00
10	4-inch Gate Valve and Box	Each		$ 1,430.00	$ -
11	5-inch Gate Valve and Box	Each		$ 1,750.00	$ -
12	6-inch Gate Valve and Box	Each		$ 1,750.00	$ -
13	Grinder Pump Station	Each	20	$ 4,515.00	$ 90,300.00
14	Electrical Connection	Lineal Foot	1000	$ 7.50	$ 7,500.00
15	Air Relief and Flushing Station	Each	3	$ 4,640.00	$ 13,920.00
16	Flushing Station	Each	4	$ 3,125.00	$ 12,500.00
17	1.25-inch HDPE Service Force Main	Lineal Foot	8000	$ 35.00	$ 280,000.00
18	1.25-inch HDPE Service Force Main - 80 Feet-Bored Under M-64	Each	1	$ 4,400.00	$ 4,400.00
19	Connect to Existing Lift Station	Each	1	$ 7,000.00	$ 7,000.00
20	Jack & Bore Railroad Crossing - Hoop & Holler Road	Lump Sum	1	$ 10,450.00	$ 10,450.00
21	Rock Excavation	Cubic Yd	150	$ 125.00	$ 18,750.00
22	Special Backfill	Cubic Yd	150	$ 9.00	$ 1,350.00
23	Stone Refill (MDOT 6A)	Cubic Yd	50	$ 28.00	$ 1,400.00
24	Erosion Control	Lump Sum	0.1	$ 48,000.00	$ 4,800.00
25	Utility Exploration	Each	3	$ 400.00	$ 1,200.00
26	Service Line Connection (Fused Saddle Tap)	Each	20	$ 1,100.00	$ 22,000.00
27	Tee Connection (Less than 3-inch)	Each	1	$ 850.00	$ 850.00
28	Spare "Pump Core" Units	Each	2	$ 1,400.00	$ 2,800.00
29	Asphalt Pavement (330#/syd 13A)	Sq. Yard	25	$ 20.00	$ 500.00
30	8 inches of MDOT 23A Gravel	Sq. Yard	1500	$ 7.00	$ 10,500.00
31	8 inches of MDOT 22A Gravel	Sq. Yard	25	$ 7.00	$ 175.00
32	Clearing	Acre	0.8	$ 6,500.00	$ 5,200.00
33	Earth Excavation / placement	Cubic Yd	2060	$ 7.00	$ 14,420.00
34	Liner	Sq. Yard	1800	$ 4.00	$ 7,200.00
35	Sand Cover	Cubic Yd	600	$ 11.00	$ 6,600.00
36	Lift Station	Each		$ 226,800.00	$ -
37	Lagoon Cell	Lump Sum		$ 516,000.00	$ -
38	Land for Lagoon Cell	Acre		$ 1,000.00	$ -
39	Monitoring Wells	Each	1	$ 5,500.00	$ 5,500.00
40	Topsoil	Cubic Yd	170	$ 20.00	$ 3,400.00
41	Restoration	Lump Sum	0.1	$ 90,000.00	$ 9,000.00
42	Roadway Gravel	Cubic Yd	20	$ 20.00	$ 400.00
43	Fencing	Lineal Foot	200	$ 20.00	$ 4,000.00
	Estimated Direct Construction				$ 857,500.00
	Contingencies (10%)				$ 85,750.00
	Engineering (18%)				$ 154,350.00
	Admin / Legal (lots of Easements)				$ 140,000.00
	Estimated Construction Total				$ 1,237,600.00

Figure 17. User Charge Analysis, Project for 20 Users, 2.375% Interest

	Percent Grant			
CAPITAL COSTS (1)	0%	25%	50%	75%
CONSTRUCTION	$857,500	$857,500	$857,500	$857,500
ENGINEERING, LEGAL, ADMINISTRATION, EASEMENTS, CONTINGENCIES, ETC.	$380,100	$380,100	$380,100	$380,100
CONSTRUCTION TOTAL	$1,237,600	$1,237,600	$1,237,600	$1,237,600
CAPITALIZED INTEREST	$45,743	$34,307	$22,871	$11,436
TOTAL FUNDS NEEDED	$1,283,343	$1,271,907	$1,260,471	$1,249,036
GRANT/LOAN AMOUNTS				
GRANT	$0	$309,400	$618,800	$928,200
Loan Funding Needed for Construction:	$1,283,343	$962,507	$641,671	$320,836
Principal from Bond (round to nearest $1000):	$1,284,000	$963,000	$642,000	$321,000
EDUs NEW SYSTEM	20	20	20	20
MONTHLY CHARGE PER EDU	$500.76	$441.55	$382.34	$323.13

Figure 18. User Charge Analysis, Project for 20 Users, 3% Interest

	Percent Grant			
CAPITAL COSTS (1)	0%	25%	50%	75%
CONSTRUCTION	$857,500	$857,500	$857,500	$857,500
ENGINEERING, LEGAL, ADMINISTRATION, EASEMENTS, CONTINGENCIES, ETC.	$380,100	$380,100	$380,100	$380,100
CONSTRUCTION TOTAL	$1,237,600	$1,237,600	$1,237,600	$1,237,600
CAPITALIZED INTEREST	$58,320	$43,740	$29,160	$14,580
TOTAL FUNDS NEEDED	$1,295,920	$1,281,340	$1,266,760	$1,252,180
GRANT/LOAN AMOUNTS				
GRANT	$0	$309,400	$618,800	$928,200
Loan Funding Needed for Construction:	$1,295,920	$971,940	$647,960	$323,980
Principal from Bond (round to nearest $1000):	$1,296,000	$972,000	$648,000	$324,000
EDUs NEW SYSTEM	20	20	20	20
MONTHLY CHARGE PER EDU	$528.01	$461.99	$395.97	$329.94

Figure 19. User Charge Analysis, Project for 20 Users, 4% Interest

	Percent Grant			
CAPITAL COSTS (1)	0%	25%	50%	75%
CONSTRUCTION	$857,500	$857,500	$857,500	$857,500
ENGINEERING, LEGAL, ADMINISTRATION, EASEMENTS, CONTINGENCIES, ETC.	$380,100	$380,100	$380,100	$380,100
CONSTRUCTION TOTAL	$1,237,600	$1,237,600	$1,237,600	$1,237,600
CAPITALIZED INTEREST	$79,020	$59,280	$39,540	$19,800
TOTAL FUNDS NEEDED	$1,316,620	$1,296,880	$1,277,140	$1,257,400
GRANT/LOAN AMOUNTS				
GRANT	$0	$309,400	$618,800	$928,200
Loan Funding Needed for Construction:	$1,316,620	$987,480	$658,340	$329,200
Principal from Bond (round to nearest $1000):	$1,317,000	$988,000	$659,000	$330,000
EDUs NEW SYSTEM	20	20	20	20
MONTHLY CHARGE PER EDU	$575.58	$497.73	$419.87	$342.01

Figure 20. User Charge Analysis, Project for 20 Users, 6% Interest

	Percent Grant			
CAPITAL COSTS (1)	0%	25%	50%	75%
CONSTRUCTION	$857,500	$857,500	$857,500	$857,500
ENGINEERING, LEGAL, ADMINISTRATION, EASEMENTS, CONTINGENCIES, ETC.	$380,100	$380,100	$380,100	$380,100
CONSTRUCTION TOTAL	$1,237,600	$1,237,600	$1,237,600	$1,237,600
CAPITALIZED INTEREST	$122,400	$91,800	$61,200	$30,600
TOTAL FUNDS NEEDED	$1,360,000	$1,329,400	$1,298,800	$1,268,200
GRANT/LOAN AMOUNTS				
GRANT	$0	$309,400	$618,800	$928,200
Loan Funding Needed for Construction:	$1,360,000	$1,020,000	$680,000	$340,000
Principal from Bond (round to nearest $1000):	$1,360,000	$1,020,000	$680,000	$340,000
EDUs NEW SYSTEM	20	20	20	20
MONTHLY CHARGE PER EDU	$683.79	$578.82	$473.85	$368.89

Conclusions:

The overall project cost goes down with the shortened versions. However, the cost per user actually increases with each successively-shorter project. This is due in part to the overall reduction in users on the system. More so, eliminating Lake Gogebic State Park campground (projects 2, 3 and 4 do not included the State Park) greatly reduces the number of EDUs on the system, while only having a minor reduction in project costs.

1. APPLICATION FOR FEDERAL ASSISTANCE

APPLICATION FOR FEDERAL ASSISTANCE

Version 7/03

		2. DATE SUBMITTED	Applicant Identifier
1. TYPE OF SUBMISSION: Application ☐ Construction ☐ Non-Construction	Pre-application ☑ Construction ☐ Non-Construction	3. DATE RECEIVED BY STATE	State Application Identifier
		4. DATE RECEIVED BY FEDERAL AGENCY	Federal Identifier

5. APPLICANT INFORMATION

Legal Name: Lake Gogebic Area Sewer Authority	Organizational Unit:
	Department:
Organizational DUNS: 081175674	Division:
Address:	**Name and telephone number of person to be contacted on matters involving this application (give area code)**
Street: P.O. Box 198	Prefix: Mr. / First Name: Kelly
City: Marenisco	Middle Name
County: Gogebic	Last Name: Dunbar
State: Michigan / Zip Code: 49947	Suffix:
Country: United States	Email: dunbark1@michigan.gov
6. EMPLOYER IDENTIFICATION NUMBER *(EIN):* 46-1063934	Phone Number (give area code): 906-392-0011 / Fax Number (give area code):

8. TYPE OF APPLICATION:

☑ New ☐ Continuation ☐ Revision

If Revision, enter appropriate letter(s) in box(es)
(See back of form for description of letters.)

Other (specify)

7. TYPE OF APPLICANT: (See back of form for Application Types)

O.

Other (specify)
Sewer Authority

9. NAME OF FEDERAL AGENCY:
USDA-Rural Development

10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER:

10-760

TITLE (Name of Program):
Water and Waste Loan & Grant program

11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT:

Phase I Sewer Project (map and narrative attached).

Low pressure sewer system to serve west shore of Lake Gogebic on M-64 between Bergland and Marenisco.

12. AREAS AFFECTED BY PROJECT *(Cities, Counties, States, etc.):*

Ontonagon and Gogebic Counties

13. PROPOSED PROJECT

Start Date:	Ending Date:
May 2019	November 2019

14. CONGRESSIONAL DISTRICTS OF:

a. Applicant	b. Project
1	1

15. ESTIMATED FUNDING:

a. Federal	$ 11,001,200.00
b. Applicant	$ .00
c. State	$ .00
d. Local	$ .00
e. Other	$ .00
f. Program Income	$ .00
g. TOTAL	$ 11,001,200.00

16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?

a. Yes. ☑ THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON

DATE: 5-9-2018

b. No. ☐ PROGRAM IS NOT COVERED BY E. O. 12372

☐ OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW

17. IS THE APPLICANT DELINQUENT ON ANY FEDERAL DEBT?

☐ Yes If "Yes" attach an explanation. ☑ No

18. TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS APPLICATION/PREAPPLICATION ARE TRUE AND CORRECT. THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE IS AWARDED.

a. Authorized Representative

Prefix: Mr.	First Name: Kelly	Middle Name
Last Name: Dunbar		Suffix
b. Title: Chairperson		c. Telephone Number (give area code): 906-392-0011
d. Signature of Authorized Representative: Kelly Dunbar		e. Date Signed: 5/7/18

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Standard Form 424 (Rev.9-2003)
Prescribed by OMB Circular A-102

INSTRUCTIONS FOR THE SF-424

Public reporting burden for this collection of information is estimated to average 45 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0043), Washington, DC 20503.

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

This is a standard form used by applicants as a required face sheet for pre-applications and applications submitted for Federal assistance. It will be used by Federal agencies to obtain applicant certification that States which have established a review and comment procedure in response to Executive Order 12372 and have selected the program to be included in their process, have been given an opportunity to review the applicant's submission.

Item:	Entry:	Item:	Entry:
1.	Select Type of Submission.	11.	Enter a brief descriptive title of the project. If more than one program is involved, you should append an explanation on a separate sheet. If appropriate (e.g., construction or real property projects), attach a map showing project location. For preapplications, use a separate sheet to provide a summary description of this project.
2.	Date application submitted to Federal agency (or State if applicable) and applicant's control number (if applicable).	12.	List only the largest political entities affected (e.g., State, counties, cities).
3.	State use only (if applicable).	13	Enter the proposed start date and end date of the project.
4.	Enter Date Received by Federal Agency Federal identifier number: If this application is a continuation or revision to an existing award, enter the present Federal Identifier number. If for a new project, leave blank.	14.	List the applicant's Congressional District and any District(s) affected by the program or project
5.	Enter legal name of applicant, name of primary organizational unit (including division, if applicable), which will undertake the assistance activity, enter the organization's DUNS number (received from Dun and Bradstreet), enter the complete address of the applicant (including country), and name, telephone number, e-mail and fax of the person to contact on matters related to this application.	15	Amount requested or to be contributed during the first funding/budget period by each contributor. Value of in kind contributions should be included on appropriate lines as applicable. If the action will result in a dollar change to an existing award, indicate only the amount of the change. For decreases, enclose the amounts in parentheses. If both basic and supplemental amounts are included, show breakdown on an attached sheet. For multiple program funding, use totals and show breakdown using same categories as item 15.
6.	Enter Employer Identification Number (EIN) as assigned by the Internal Revenue Service.	16.	Applicants should contact the State Single Point of Contact (SPOC) for Federal Executive Order 12372 to determine whether the application is subject to the State intergovernmental review process.
7.	Select the appropriate letter in the space provided. A. State B. County C. Municipal D. Township E. Interstate F. Intermunicipal G. Special District H. Independent School District I. State Controlled Institution of Higher Learning J. Private University K. Indian Tribe L. Individual M. Profit Organization N. Other (Specify) O. Not for Profit Organization	17.	This question applies to the applicant organization, not the person who signs as the authorized representative. Categories of debt include delinquent audit disallowances, loans and taxes.
8.	Select the type from the following list: • "New" means a new assistance award. • "Continuation" means an extension for an additional funding/budget period for a project with a projected completion date. • "Revision" means any change in the Federal Government's financial obligation or contingent liability from an existing obligation. If a revision enter the appropriate letter: A. Increase Award B. Decrease Award C. Increase Duration D. Decrease Duration	18	To be signed by the authorized representative of the applicant. A copy of the governing body's authorization for you to sign this application as official representative must be on file in the applicant's office. (Certain Federal agencies may require that this authorization be submitted as part of the application.)
9.	Name of Federal agency from which assistance is being requested with this application.		
10.	Use the Catalog of Federal Domestic Assistance number and title of the program under which assistance is requested.		

OMB Approval No. 0348-0041

BUDGET INFORMATION - Construction Programs

NOTE: Certain Federal assistance programs require additional computations to arrive at the Federal share of project costs eligible for participation. If such is the case, you will be notified.

COST CLASSIFICATION	a. Total Cost	b. Costs Not Allowable for Participation	c. Total Allowable Costs (Columns a-b)
1. Administrative and legal expenses	$ 140,000.00	$	$ 140,000.00
2. Land, structures, rights-of-way, appraisals, etc.	$	$	$ 0.00
3. Relocation expenses and payments	$	$	$ 0.00
4. Architectural and engineering fees	$ 1,002,500.00	$	$ 1,002,500.00
5. Other architectural and engineering fees	$	$	$ 0.00
6. Project inspection fees	$ 385,600.00	$	$ 385,600.00
7. Site work	$	$	$ 0.00
8. Demolition and removal	$	$	$ 0.00
9. Construction	$ 7,711,700.00	$	$ 7,711,700.00
10. Equipment	$	$	$ 0.00
11. Miscellaneous (Capitalized Interest)	$ 990,200.00	$	$ 990,200.00
12. SUBTOTAL *(sum of lines 1 -11)*	$ 10,230,000.00	$ 0.00	$ 10,230,000.00
13. Contingencies	$ 771,200.00	$	$ 771,200.00
14. SUBTOTAL	$ 11,001,200.00	$ 0.00	$ 11,001,200.00
15. Project (program) income	$	$	$ 0.00
16. TOTAL PROJECT COSTS (subtract #15 from #14)	$ 11,001,200.00	$ 0.00	$ 11,001,200.00

FEDERAL FUNDING		
17. Federal assistance requested, calculate as follows: (Consult Federal agency for Federal percentage share.) Enter the resulting Federal share.	Enter eligible costs from line 16c Multiply X 100 %	$ 11,001,200.00

OMB Approval No. 0348-0042

ASSURANCES - CONSTRUCTION PROGRAMS

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the Awarding Agency. Further, certain Federal assistance awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance, and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project costs) to ensure proper planning, management and completion of the project described in this application.

2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the assistance; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.

3. Will not dispose of, modify the use of, or change the terms of the real property title, or other interest in the site and facilities without permission and instructions from the awarding agency. Will record the Federal interest in the title of real property in accordance with awarding agency directives and will include a covenant in the title of real property acquired in whole or in part with Federal assistance funds to assure non- discrimination during the useful life of the project.

4. Will comply with the requirements of the assistance awarding agency with regard to the drafting, review and approval of construction plans and specifications.

5. Will provide and maintain competent and adequate engineering supervision at the construction site to ensure that the complete work conforms with the approved plans and specifications and will furnish progress reports and such other information as may be required by the assistance awarding agency or State.

6. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.

7. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.

8. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).

9. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.

10. Will comply with all Federal statutes relating to non-discrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681 1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) underwhich application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

11. Will comply, or has already complied, with the requirements of Titles 11 and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal and federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.

12. Will comply with the provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

13. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333) regarding labor standards for federally-assisted construction subagreements.

14. Will comply with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is $10,000 or more.

15. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91- 190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).

16. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.

17. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).

18. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-1 33, "Audits of States, Local Governments, and Non-Profit Organizations."

19. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL	TITLE
[signature]	Chairperson
APPLICANT ORGANIZATION	DATE SUBMITTED
Lake Gogebic Area Sewer Authority	5-8-2018

LAKE GOGEBIC AREA SEWER AUTHORITY
PRESSURE SEWER SYSTEM TO SERVE THE WEST SHORE OF LAKE GOGEBIC

Project Narrative

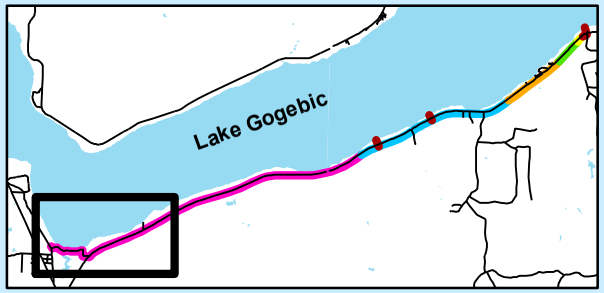
In 2012, the Township of Bergland constructed a pressure sewer system, in part, to address environmental degradation in and around the area of Lake Gogebic. The project resulted in approximately 1.5 miles of sewerage around a portion of the northwestern shoreline of the lake. The goal was to use a phased construction approach to eventually see sewerage provided along the entire 34.4 miles of shoreline. Currently, the un-sewered area around the lake is serviced by private on-site septic systems. Many of these private systems are failing due to poor soil conditions and aging facilities.

Lake Gogebic Area Sewer Authority (LGASA) has since been incorporated to undertake the remaining phases of sewer construction along the Lake Gogebic shoreline. Due to limitations associated with the soils in the project area, replacement systems often require the construction of mound-type systems. These systems are often difficult to install due to lack of available land, and are prohibitively expensive for many property owners in the area. Additionally, the limited life expectancy of the systems (approximately 20 years) offers only a temporary solution to long-term environmental problems.

LGASA desires to continue the phased-approach, with Phase I consisting of approximately 8.3 miles of low-pressure sewer mains to serve the majority of the west shore of Lake Gogebic. This would be accomplished by installing small-diameter low-pressure HDPE force main within State Highway M-64 Right-of-Way. Individual grinder pump stations will be installed at residences and businesses, with the pressurized service lines tapped into the force mains.

The proposed system will discharge into an existing lift station, owned and operated by Bergland Township, and ultimately will be discharged into the existing Bergland Township wastewater lagoons. However, two additional lift stations and one additional lagoon cell will be required as part of the proposed project.

The Authority is seeking financial assistance in the form of grants and loans from USDA – Rural Development in order to accomplish this project.



Lift Station #2

Zone 15

See Sheet 2

1354 ft

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

User Location

6" Force Main

5" Force Main

4" Force Main

3" Force Main

2" Force Main

1.5" Force Main

0 500 1,000

Feet

1 inch = 1,250 feet

Project:	15440
Drawn:	MCH
Date:	4/11/2018
Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	1

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635 Circle Drive
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200 East Ayer Street
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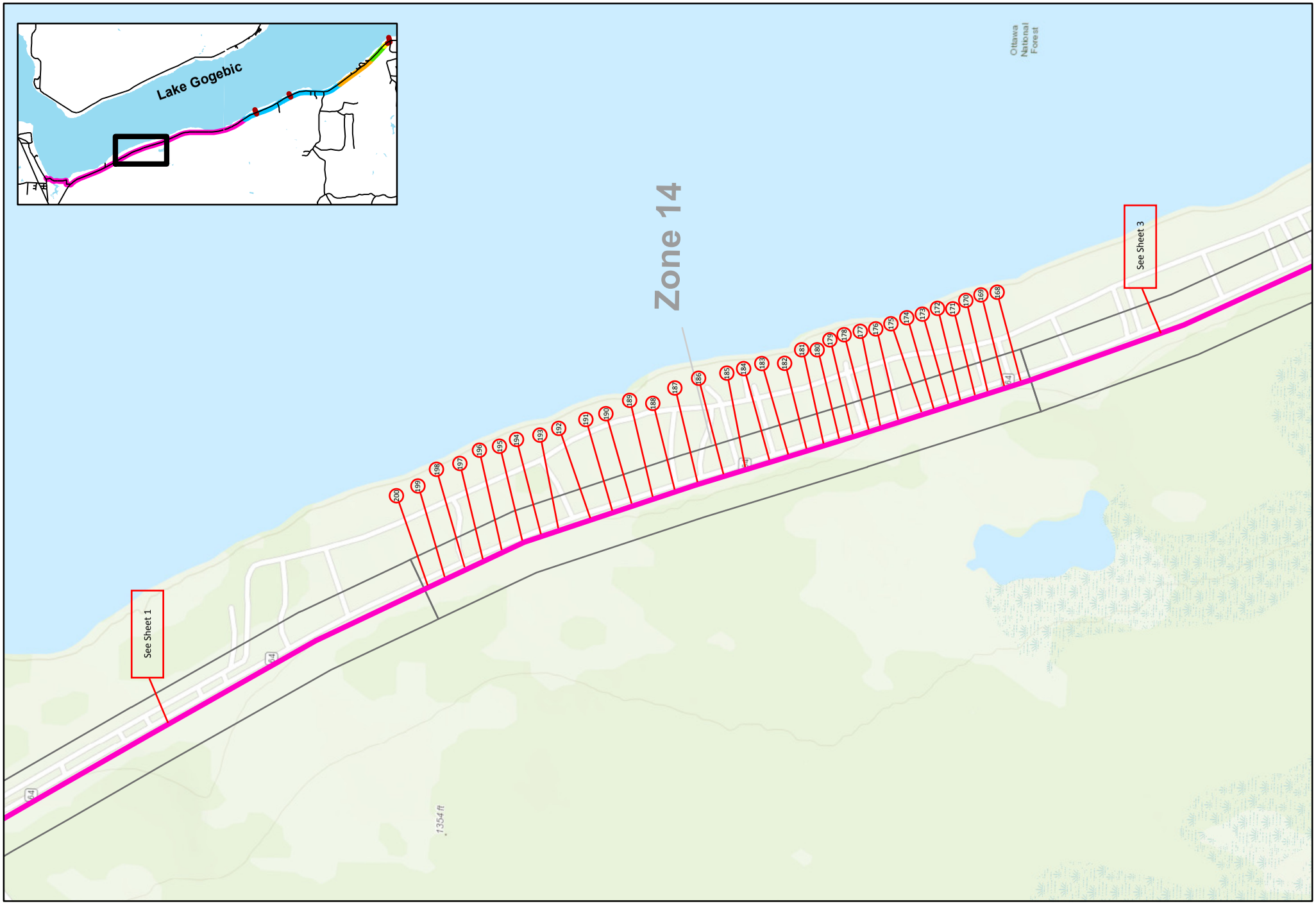

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

User Location

6" Force Main

5" Force Main

4" Force Main

3" Force Main

2" Force Main

1.5" Force Main

0 250 500

Feet

1 inch = 750 feet

Project:	15440
Drawn:	MCH
Date:	4/11/2018
Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	2

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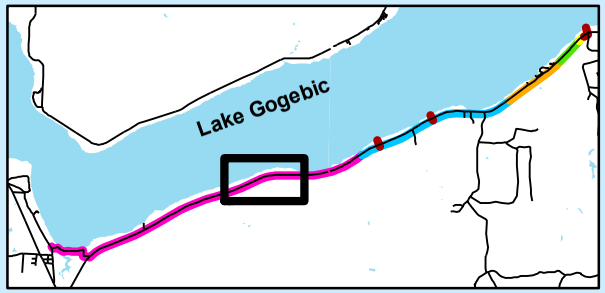

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

User Location

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1.5" Force Main

0 250 500

Feet

1 inch = 750 feet

Project:	15440
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Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	3

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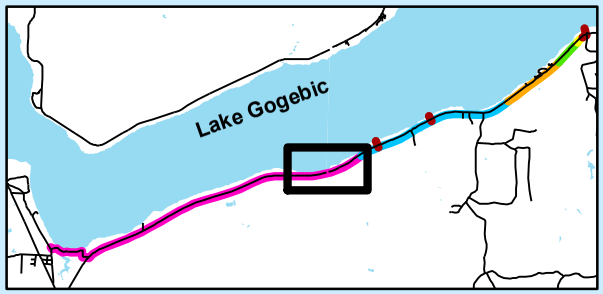

Zone 12

Zone 12

ONTONAGON GOGEBIC

State Highway M64

State Highway M64

Hendrick Creek

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

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0 250 500

Feet

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Project:	15440
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Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	4

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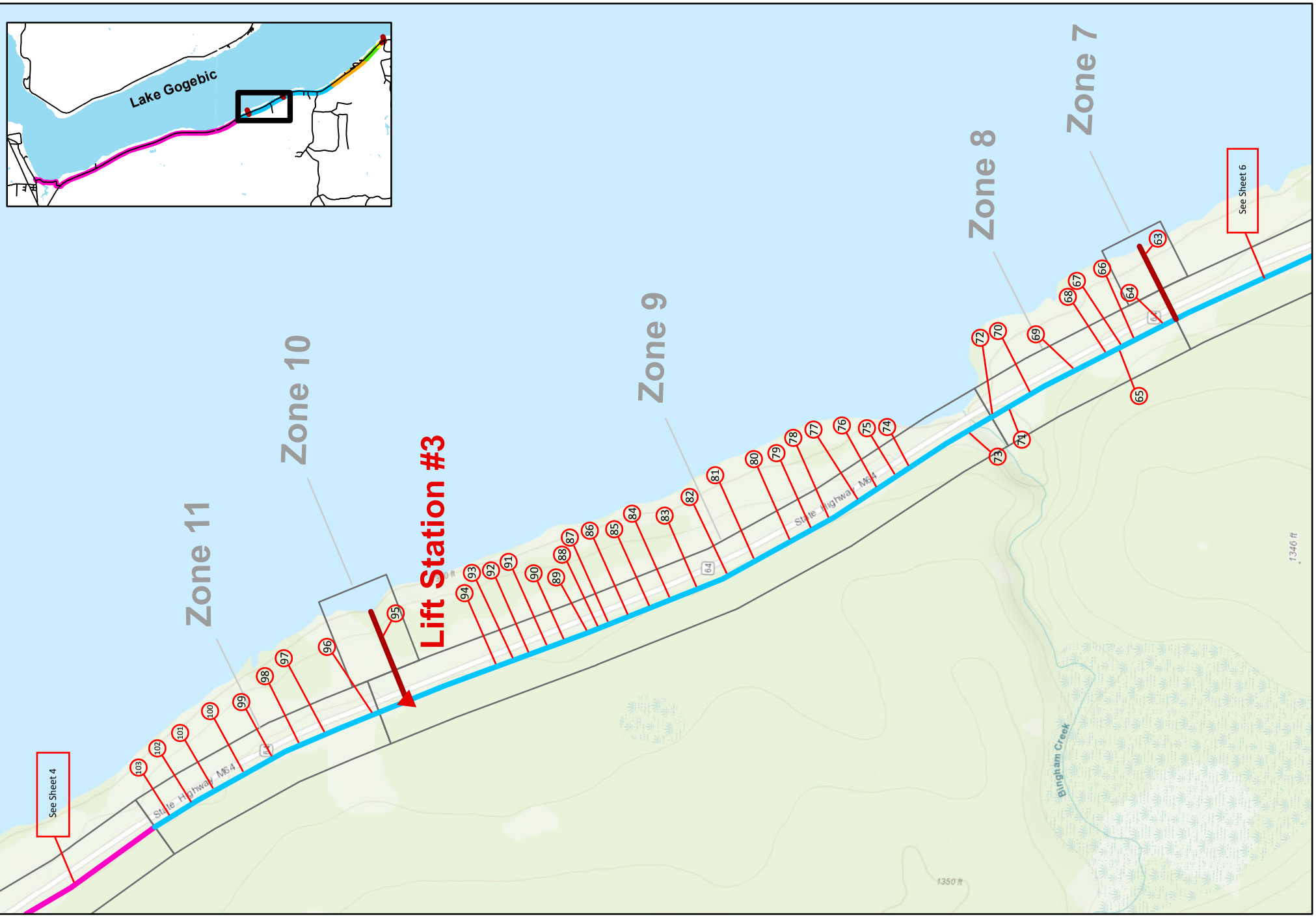

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

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Feet

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Figure:	5

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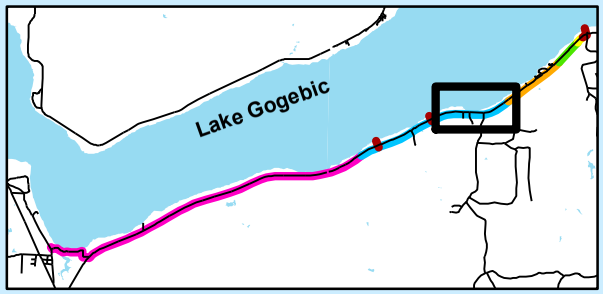

Zone 7

Zone 6

Zone 5

See Sheet 5

See Sheet 7

State Highway M64

Gillis Creek

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

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Feet

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Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	6

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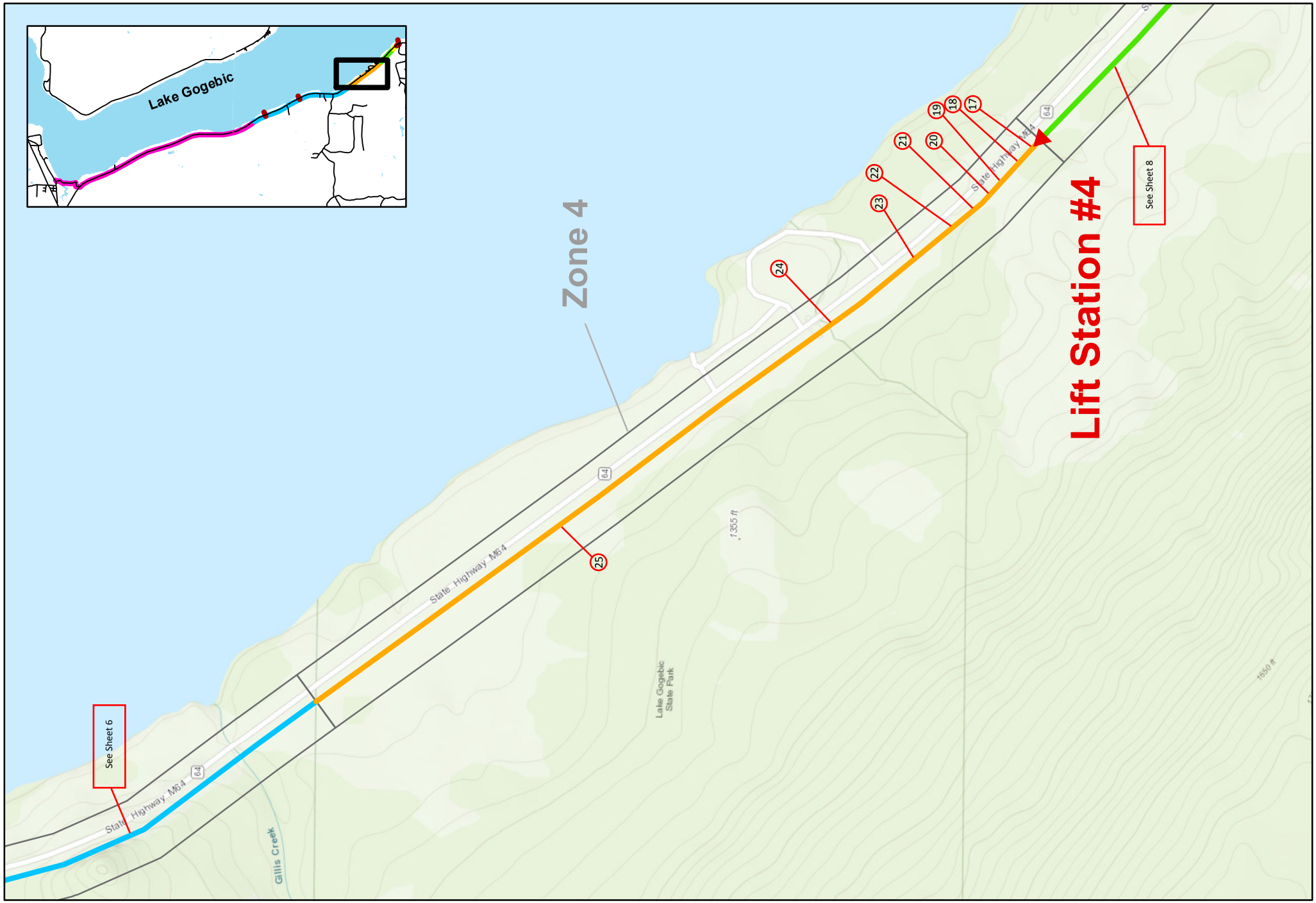

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

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Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	7

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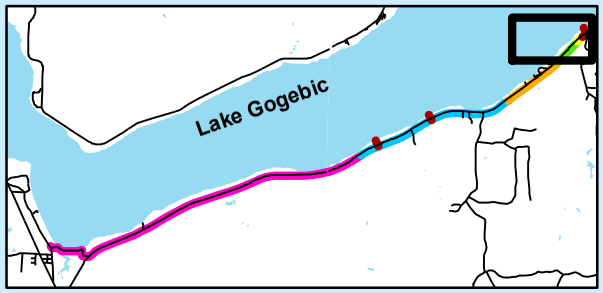
(906)932-5048
www.coleman-engineering.com



Zone 1

Zone 2

Zone 3

Lift Station #4

Alligator Point

State Highway M64

See Sheet 7

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

User Location

6" Force Main

5" Force Main

4" Force Main

3" Force Main

2" Force Main

1.5" Force Main

0 250 500

Feet

1 inch = 750 feet

Project:	15440
Drawn:	MCH
Date:	4/11/2018
Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	8

COLEMAN ENGINEERING COMPANY
635 Circle Drive
Iron Mountain, Michigan 49801
(906)774-3440
200 East Ayer Street
Ironwood, Michigan 49938
(906)932-5048
www.coleman-engineering.com

2. STATE AND REGIONAL CLEARINGHOUSE

Date: May 9, 2018

To: Mr. Kelly Dunbar
Lake Gogebic Area Sewer Authority
P.O. Box 198
Marenisco, MI 49947

From: Michigan Single Point of Contact
SEMCOG (Southeast Michigan Council of Governments)

Subject: State Local Government Review Under Presidential Executive Order 12372

Project: Phase I Sewer Project

Funding Agency/Program: Department of Agriculture
Catalog of Federal Domestic Assistance Number: 10.76

Your project has been received by SEMCOG, the public agency designated by the State of Michigan, to act as the "Single Point of Contact" for review of federal and federally assisted projects pursuant to Presidential Executive Order 12372 - Intergovernmental Review of Federal Programs. This intergovernmental review process allows state agencies, areawide/regional planning agencies, and local units of government the opportunity to perform an advisory review of projects seeking federal funds.

The review process should not exceed 60 days, unless the funding agency, reviewing agency, and project sponsor are in the process of negotiating/discussing concerns related to the project.The Michigan Federal Project Review System will attempt to limit reviews to 40 days. SEMCOG will send a list of projects received to state departments and regional planning agencies. For projects of less than statewide impact, please send a copy of the project application to the affected regional planning agency(ies). Additionally, regional planning agencies may contact affected local governments for comments on projects which directly impact them. If necessary, follow-up meetings or discussions will be held by state departments and/or regional planning agencies to resolve problems. Failure to resolve problems could result in negative comments being sent to the funding agency.

Please consider the review period to be concluded if you do not hear from a state or regional review agency within 40 days of this letter. Your project's file number is **180260** . Please refer to this number if the funding agency requires a state clearinghouse file application identifier number.

For further information contact Ed Hug, Regional Review Office, SEMCOG, (313) 324-3335.

Note: Applicant is responsible for providing all comments they receive to the funding agency.

For information on intergovernmental review in Michigan go to http://www.semcog.org/About-SEMCOG/What-We-Do/Clearinghouse-Review

3. CERTIFICATION OF COMMERCIAL CREDIT

Availability of Other Commercial Credit Certification

Applicants must certify in writing that they are unable to finance the proposed project from their own resources or through commercial credit at reasonable rates and terms that will allow them to maintain user rates comparable to other similar systems.

Applicants must sign this certification which provides documentation of contact with a lending institution. Offers or denials of commercial credit should be documented below with the name of lending institution, name of contact, rates and terms available and reason why credit would not be available.

To assist us in determining commercial credit availability, please answer the following questions:

1. List the top three employers in your community and approximate number of employees.
   - Gogebic Lodge — 6
   - Fishtales Resort — 6
   - West Shore Resort — 5
2. What was the unemployment rate in your county last year? 8.3% Ontonagon County; 6.5% Gogebic County (2016).
3. What is your State Equalized Value (SEV)? $ N/A
4. Have you issued Bonds previously? Yes ___ No _X_ Were they rated? Yes___ No ___
5. Do you have existing debt on your system? Yes ___ No _X_
   If so, who holds the bonds? N/A (attach copies of existing bond/debt instruments)
6. What is your taxing capacity? N/A Mills
7. Is there a levy currently on the water or sewer system? Yes ___No_X_ If so, how many mills? _____

Commercial credit financing in the amount of $ 10,000,000* was discussed with the following lending institutions:

Lender:	First National Bank – Wakefield, MI	Interest Rate:	N/A	Term:	N/A
Contact:	Paula Koruga				
Lender:	Wells Fargo	Interest Rate:	4.75%	Term:	20 years
Contact:	Michele Hupler				
Lender:	Gogebic Range Bank	Interest Rate:	6.00%	Term:	20 years
Contact:	Crystal Kuklinski				

*Please see attached supporting document. In general, $10M exceeds the lending limits of all three institutions.

The undersigned certifies, to the best of their knowledge and belief, that:

1. The organization is unable to finance the proposed project from its own resources or through commercial credit at reasonable rates and terms.
2. No outstanding judgment has been obtained and recorded by the United States of America in a Federal Court (other than in the United States Tax Court).

Lake Gogebic Area Sewer Authority
Name of Organization

Name and Signature of Authorized Official — Date 5/7/14

Record of Phone Conversations Regarding Commercial Credit Availability – LGASA Sewer Phase I

Lender #1: ~~Northern Bank & Trust~~ First National Bank Wakefield, MI Date: 4/6/18

Contact Person: Paula Koruga

Interest rate:

Number of Years:

Type of Security:

Notes: No specific lending terms were discussed, as Paula Koruga indicated $10M exceeds their lending limit.

Lender #2: Wells Fargo; Ironwood, MI Date: 4/6/18 / 4/9/18

Contact Person: Ben Drier / Michelle Hupler (Main Branch)

Interest rate: 4.75%

Number of Years: 20 years

Type of Security:

Notes: $10M exceeds lending limit

Lender #3: Gogebic Range Bank; Ironwood, MI Date: 4/6/18

Contact Person: Crystal Kuklinski

Interest rate: 6%

Number of Years: 20 years / 5-year balloon

Type of Security:

Notes:

Crystal indicated that $10M exceeds their lending limit, but could possibly offer a $10M/20-yr loan with other investors on-board. Would include a 5-year balloon payment

4. AUDIT REPORT – not required

Audit Report

An audit report is not required for this project.

5. PUBLIC NOTICE OF INTENT

NOTICE OF INTENT TO FILE APPLICATION FOR FEDERAL ASSISTANCE

Lake Gogebic Area Sewer Authority intends to apply for loan funding assistance for a sanitary sewer construction project. The project consists of installation of sewer service along the west shore of Lake Gogebic and expansion to the existing wastewater treatment lagoons in Bergland Township. The purpose of the project is to address environmental concerns associated with the condition of existing private septic systems in the project area. The estimated cost of the project is $11.0 million. The project is anticipated to be constructed in 2019. The application for federal assistance will be filed with the United States Department of Agriculture – Rural Development office within sixty (60) days of this notice.

All comments and inquiries should be directed to:

Mr. Kelly Dunbar, Chairperson
Lake Gogebic Area Sewer Authority
P.O. Box 43
Marenisco, MI 49947

May 9, 2018

Work Session, Ironwood City Commission, 4:30 p.m., Women's Club Room, 2nd Floor.

Bessemer Township Board, 5 p.m., Bessemer Township Hall, Ramsay.

Ironwood Township Board, 5:30 p.m., Ironwood Township offices.

Wakefield City Council, 5:30 p.m., City Hall.

Ironwood City Commission, 5:30 p.m., Ironwood Memorial Building.

Bessemer Downtown Development Authority, 5:30 p.m., City Hall, Bessemer.

Gogebic County Fair Board, 5:30 p.m., fairgrounds.

Town of Carey, 6 p.m., Carey Town Hall.

Oma Town Board, 6 p.m. Oma Town Hall

wy of
ight

ous word.
ischief, happy memories
a year ago, May 10, 2017.
mountain!
esterdays back and see your
e door saying "Hi Mom",
day?"
ould see a "Trail of Tears."
emory we treasure, loving
er. Our group hugs, we miss
h of kisses and hugs!

OO

ieces Nicole (Frank),
nephew Jimmy

NOTICE OF INTENT TO FILE APPLICATION FOR FEDERAL ASSISTANCE

Lake Gogebic Area Sewer Authority intends to apply for loan funding assistance for a sanitary sewer construction project. The project consists of installation of sewer service along the west shore of Lake Gogebic and expansion to the existing wastewater treatment lagoons in Bergland Township. The purpose of the project is to address environmental concerns associated with the condition of existing private septic systems in the project area. The estimated cost of the project is $11.0 million. The project is anticipated to be constructed in 2019. The application for federal assistance will be filed with the United States Department of Agriculture – Rural Development office within sixty (60) days of this notice.

All comments and inquiries should be directed to:

Mr. Kelly Dunbar, Chairperson
Lake Gogebic Area Sewer Authority
P.O. Box 43
Marenisco, MI 49947

May 9, 2018

6. CUSTOMER INFORMATION

CUSTOMER USER INFORMATION

1.) Rural Development uses some of the information from the PER, especially Sections 6(e) and (f), for underwriting purposes. Note that for income projection purposes, every effort should be made to identify actual data regarding water usage or wastewater generation. For metered systems, actual data should be used.

When financing construction of a new system or improvements to an existing system without any existing usage data, water use and wastewater generation approximation for income projection purposes should, if at all possible, be based on information from surrounding similar communities and systems. The source of data used should be documented in the PER.

The value of 100 GPCD shown in Section 6 is a general value and may not be appropriate for many rural systems finance with WWD funds. In the absence of reliable data, a value of **5,000 gallons per EDU per month** (approximately 67 GPCD or 167 GPD per EDU) should be used.

	Number of Existing Customers	Total Monthly Service Usage (in gallons)	Number of Users after Improvements	Projected Total Monthly Service Usage (in gallons)	EDU's (Agency Use)
Residential Dwellings:			**212**	**650,000**	
Commercial Users:			**6**	**402,400**	
Total:			**218**	**1,052,400**	

Breakdown of Commercial Users	Number Existing Users	Number of User after project completion	Billed/Metered Monthly Total Service Usage
Large Commercial		0	N/A
Small Commercial		3	110,500
Industrial		0	N/A
Government		3	291,900
Churches		0	N/A
Apartment Buildings		0	N/A
Duplexes		0	N/A
Schools		0	N/A
Mobile Home Park		0	N/A

2.) Indicate (X) the applicant's proposed bonding (financing) method:

X	Revenue Bond (Act 94)		County Contract Bond		General Obligation Bond
	Special Assessment Bond		Water/Sewer Authority Bond		Other:

3.) The PER must have a copy of the existing rate schedule, if applicable. Applicant's proposed operating budget, rates and charges must be in Preliminary Engineering Report as per Bulletin 1780-2, Preliminary Engineering Reports for Water and Waste Disposal Program, Section 2)d) and 6)f)i-iv.

4.) Project Contacts:

Applicant Contact:	Kelly Dunbar, LGASA Chairman		
Address:	P.O. Box 43; Marenisco, MI 49947		
Email Address:	dunbarK1@michigan.gov	Phone:	906-392-0011
Engineer Contact:	Paul Anderson, P.E.; Project Manager, Coleman Engineering Company		
Address:	200 E. Ayer Street, Ironwood, MI, 49938		
Email Address:	panderson@coleman-engineering.com	Phone:	906-932-5048
Bond Counsel Contact:	Steve Mann, Miller Canfield Paddock & Stone, PLC		
Address:	150 West Jefferson Ave., Suite 2500, Detroit, MI 48226		
Email Address:	mann@millercanfield.com	Phone:	313-496-7509
Legal Counsel Contact:	James Bucknell		
Address:	P.O. Box 101; Bessemer, MI 49911		
Email Address:	jamesmbucknell@outlook.com	Phone:	906-932-0401
Financial Consultant Contact:	N/A		
Address:			
Email Address:		Phone:	

5.) Applicant's Population Information by Race and Ethnicity for the proposed service area, if known:

	Asian	Black/African American	American Indian or Alaskan Native	Native Hawaiian or Pacific Islander	White	Multiple Races Selected	Other Race	Total Population
RACE	2	0	19	0	691	8	1	721

	Hispanic or Latino	Not Hispanic or Latino	Total Population
ETHNICITY	6	715	721

6.) Land Rights

	# of acres	# of acres to be leased	Purchase price of land	Market value of land
Land to be acquired:	0	0	0	0
Land now owned:	0	0	0	0

7.) Other system information

Public Water System (PWS) ID #_____.
If water is being purchased – cost per 1,000 gallons or per 100 cu. ft. $_____.

NPDES Permit #_MIG580330_ .
If wastewater treatment is by contract – cost per 1,000 gallons or per 100 cu ft. $_____.

9. CONSISTENCY WITH AREA COMPREHENSIVE DEVELOPMENT

Western Upper Peninsula
Planning & Development Region Commission

P.O. BOX 365 • HOUGHTON, MICHIGAN 49931
906-482-7205 • FAX 906-482-9032 • e-mail: info@wuppdr.org

VIA E-MAIL

May 14, 2018

Brady Halvorson, EIT
Project Engineer
200 E Ayer St
Ironwood, MI 49938

RE: Phase I Sewer Project, Lake Gogebic Area Sewer Authority

Dear Mr. Halvorson:

The Western Upper Peninsula Planning and Development Region Commission (WUPPDR) has reviewed the proposed Phase I Sewer Project of the Lake Gogebic Area Sewer Authority in Bergland and Marenisco townships. We find the project meets the needs of area residents, and we support your worthwhile efforts in securing funding.

WUPPDR's Comprehensive Economic Development Strategy (CEDS) for the Western Upper Peninsula, which includes the affected townships, identifies "... development, modernization, and renovation of public facilities, including ... sanitary sewer" as a means to create quality places to live, work, and conduct business. Thus, WUPPDR finds the project to be consistent with the CEDS.

Sincerely,

Jerald Wuorenmaa
Executive Director

10. PRELIMINARY ENGINEERING REPORT

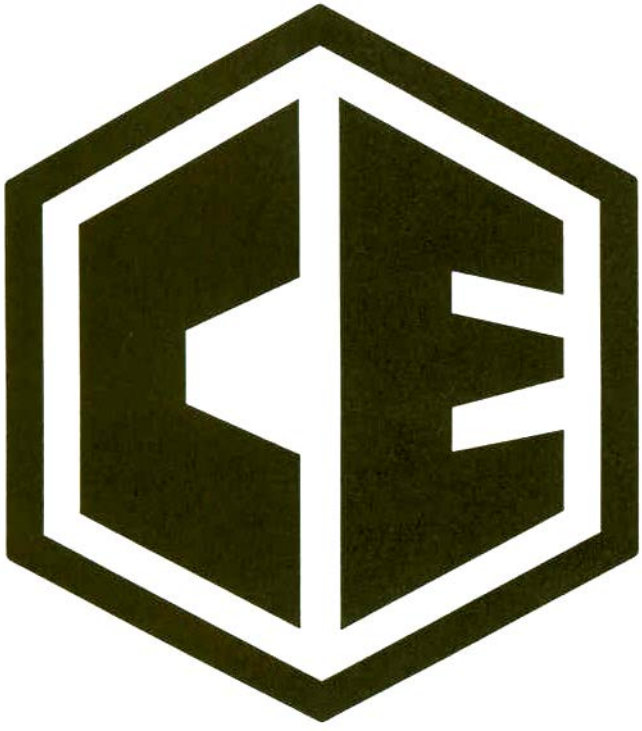
PRELIMINARY ENGINEERING REPORT

FOR

LAKE GOGEBIC AREA SEWER AUTHORITY

PHASE I SEWER PROJECT

Revised October 2018



Coleman Engineering

Civil Engineering • Environmental Engineering
Geotechnical Engineering • Land Surveying • Test Drilling
Construction Quality Control • Materials Laboratory Testing

PRELIMINARY ENGINEERING REPORT

FOR

LAKE GOGEBIC AREA SEWER AUTHORITY

PHASE I SEWER PROJECT

REVISED OCTOBER 2018

Prepared By:

COLEMAN ENGINEERING COMPANY
200 E. Ayer Street
Ironwood, MI 49938

CEC Project # EC-15440

TABLE OF CONTENTS

TABLE OF CONTENTS (*continued)*

LIST OF APPENDICES

LIST OF FIGURES

EXECUTIVE SUMMARY

This project would service 7.8 miles on the west shore of Lake Gogebic, serving 218 homes and businesses. The project is needed to address deficient or non-existent sewerage along the lake shore, as recommended by the 2009 letter from Western Upper Peninsula District Health Department (see Appendix H). Project costs for construction, engineering, administration, land purchases and capitalized interest have been estimated at $11,002,000 in 2018 dollars. Financing would be repaid by the 218 users which comprise 262 Equivalent Domestic Units (EDUs).

Assuming a market rate of 6.0%, with a fully amortized annual payment of $741,074 plus annual debt reserve, O&M costs and depreciation, the monthly sewer rate would equate to $279.43 per EDU to repay a loan for the full amount of the project. In contrast, a similar neighboring system (Merriweather system of Bergland Township) was constructed in 2012 and has a flat fee of $50 per month per EDU. Notably, the community was provided a 62.94% grant and poverty interest rates for the loan, which greatly reduced user costs. Also in comparison, Marenisco Township sewer rates are $33 per month for residential customers.

Upon submission of a preliminary funding application in summer 2018, USDA-Rural Development responded that prior to a final funding determination, several conditions would need to be met, including conducting a Median Household Income survey and submitting a resolution from each community supporting the high user rates (see Appendix I – USDA Review Letter). In October 2018, Lake Gogebic Area Sewer Authority (LGASA) made the decision to not move forward with the income survey nor the other requests of USDA RD given that the user costs appear to be well above what residents could reasonably be expected to pay. LGASA will wait to proceed with the project until more favorable funding options become available (see Appendices J & K – LGASA response letters to USDA and MDEQ).

In 2012, another engineering firm produced a project plan titled MDEQ SRF #9171-01. In this report, it was recommended to construct regional mound systems for sewage treatment for properties along Lake Gogebic. LGASA ultimately decided not to proceed with the project due to high user costs, expansive land-use associated with mound systems, and potential for long-term failure of the systems and the resulting impact on Lake Gogebic.

Included in this Executive Summary is table 6 from the report, showing various grant scenarios for a 6% interest rate (see page 2).

Table 6: User Charge Analysis – 6% Interest Rate

LAKE GOGEBIC AREA SEWER AUTHORITY
PHASE I SEWER PROJECT
USER CHARGE ANALYSIS* - 6% INTEREST RATE

	Percent Grant			
CAPITAL COSTS (1)	0%	25%	50%	75%
CONSTRUCTION	$7,711,691	$7,711,691	$7,711,691	$7,711,691
ENGINEERING, LEGAL, ADMINISTRATION, EASEMENTS, CONTINGENCIES, ETC.	$2,299,273	$2,299,273	$2,299,273	$2,299,273
CONSTRUCTION TOTAL	$10,010,964	$10,010,964	$10,010,964	$10,010,964
CAPITALIZED INTEREST (from below)	$990,180	$742,590	$495,090	$247,590
TOTAL FUNDS NEEDED	$11,001,144	$10,753,554	$10,506,054	$10,258,554
GRANT/LOAN AMOUNTS				
GRANT	$0	$2,502,741	$5,005,482	$7,508,223
USDA-RD LOAN (2)	$11,001,144	$8,250,813	$5,500,572	$2,750,331
REQUIRED BOND TO CAPITALIZE THREE INTEREST PAYMENTS AND DEFER ONE PRINCIPAL PAYMENT				
Date of Issue	5/1/2020	5/1/2020	5/1/2020	5/1/2020
Interest Rate:	6.000%	6.000%	6.000%	6.000%
Yrs Deferred Principle	2	2	2	2
Loan Funding Needed for Construction:	$11,001,144	$8,250,813	$5,500,572	$2,750,331
Principal from Bond (round to nearest $1000):	$11,002,000	$8,251,000	$5,501,000	$2,751,000
- Three Interest Payments	$990,180	$742,590	$495,090	$247,590
= Funds Available for construction	$10,011,820	$7,508,410	$5,005,910	$2,503,410
Balance (+favorable / - unfavorable)	$856	$187	$428	$669
Amort. Factor	0.0674	0.0674	0.0674	0.0674
Amortized Payment:	$741,074	$555,772	$370,537	$185,302

	Percent Grant			
USER CHARGE SCENARIO	0%	25%	50%	75%
ANNUAL LOAN PAYMENT (3)	$741,074	$555,772	$370,537	$185,302
ANNUAL USDA-RD RESERVE AMOUNT	$74,107	$55,577	$37,054	$18,530
ANNUAL O&M EXISTING SYSTEM	$0	$0	$0	$0
ANNUAL O&M PROPOSED SYSTEM	$52,340	$52,340	$52,340	$52,340
SHORT LIVED DEPRECIATION EXISTING SYSTEM	$0	$0	$0	$0
SHORT LIVED DEPRECIATION PROPOSED SYSTEM	$11,000	$11,000	$11,000	$11,000
TOTAL ESTIMATED ANNUAL EXPENSES	$878,521	$674,689	$470,931	$267,172
REVENUE FROM EXISTING USERS	$0	$0	$0	$0
YEARLY REVENUE REQUIRED FROM NEW USERS	$878,521	$674,689	$470,931	$267,172
MONTHLY REVENUE REQUIRED FROM NEW USERS	$73,210	$56,224	$39,244	$22,264
EDUs NEW SYSTEM	262	262	262	262
MONTHLY CHARGE PER EDU	$279.43	$214.60	$149.79	$84.98

INTRODUCTION

This Preliminary Engineering Report has been prepared on behalf of Lake Gogebic Area Sewer Authority (LGASA) to evaluate the possibility of constructing a new sewer system to serve the west shore of Lake Gogebic. The project will service approximately 7.8 miles along M-64, from approximately 2.2 miles south of M-28 to approximately 10.0 miles south of M-28.

The purpose of the project is to afford property owners in the project area an opportunity to come into compliance with current Health Department regulations. Most systems in the service area were installed in the 1970s prior to a local sanitary code, and are not in compliance with current regulations. Currently, structures in this area are served by privies or by privately owned septic tank/subsurface wastewater infiltration systems for wastewater disposal. The Western Upper Peninsula District Health Department estimates that 90 percent of these systems are substandard and/or failing. This results in the potential for pollution to degrade the water quality of Lake Gogebic, a valuable natural resource. LGASA desires to undertake a project to address this problem.

Properties that have sufficient land can achieve compliance by constructing mound disposal systems. However, many parcels are insufficiently large for such a replacement system. To achieve compliance, holding tanks without discharge would be required if a sewer system is not constructed.

The proposed new system would discharge into an existing lift station at the corner of Old M-28 and Hoop N Holler Road. The existing system is owned and operated by the Township of Bergland, and is considered to be a separate facility. Therefore, the proposed service area will be treated as a separate sewer service area with its own user rate structure independent of the user rates of Bergland Township.

The project will consist of small diameter high-density polyethylene pressurized mains ranging in size from 1.25-inch diameter to 6-inch diameter, along with small pumping stations equipped with one-horsepower pumps and integral sewage grinders. These pumping stations will serve individual structures, and may serve small clusters of structures, if economically feasible.

This report has been assembled in a format to meet the requirements of the United States Department of Agriculture - Rural Development (USDA-RD) to determine deficiencies within the project service area and to propose corrective action. It is expected that this document will be submitted to Rural Development as part of an application for funding assistance for the project.

SECTION 1: PROJECT PLANNING AREA

A. LOCATION

The Project is located on the west side of Lake Gogebic, spanning Gogebic and Ontonagon Counties, in the Upper Peninsula of Michigan. The project lies within Section 24 of T48N • R43W and Sections 19, 30 and 31 of T48N • R42W in the Township of Bergland, and Sections 5, 6, 8, 17, 20 and 21 of T47N • R42W in the Township of Marenisco, all within close proximity to the lake. The Project is situated along Highway M-64, between Highway M-28 and USH-2. A proposed addition to the treatment lagoons will be constructed adjacent to the existing lagoon system, located in Section 3 of T48N • R42W in Bergland Township.

The topography in the service area is moderately flat with elevations ranging from approximately 1,300 to 1,345 feet above sea level datum.

A site location and project limits map is presented in Figure 1.

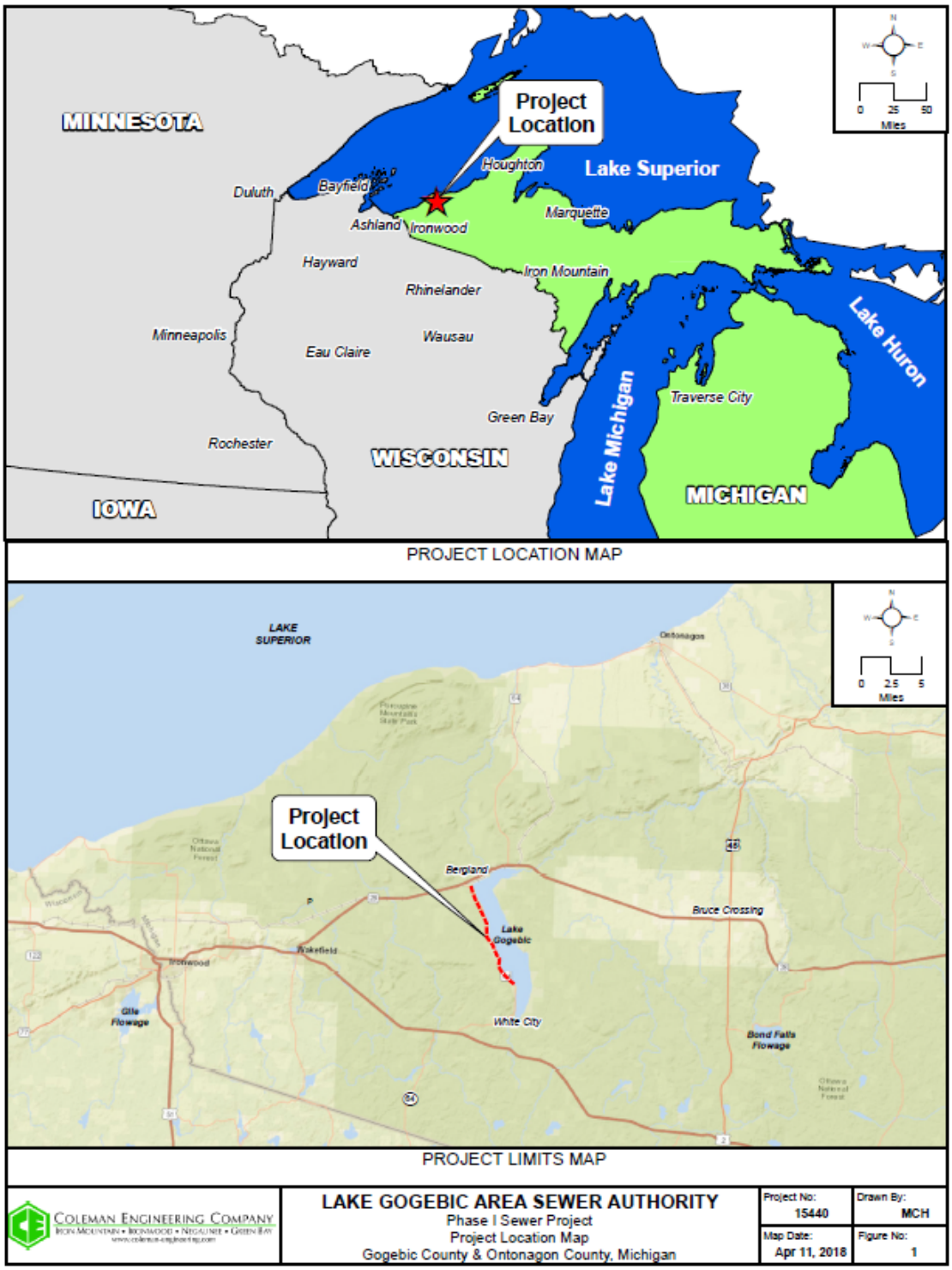
B. ENVIRONMENTAL RESOURCES PRESENT

Much of the project area is located near the shore of Lake Gogebic, the largest lake in the Upper Peninsula of Michigan. Most project activities will take place within public or railroad right-of-way and existing utility easements. However, service lines to individual grinder pump stations will be on private property.

The existing environment is that of a small, rural community. The natural environment has been modified by the construction of homes, businesses, streets and other man-made improvements. The bulk of the sewer system construction will take place in established right-of-way, utility and railroad corridors, and in areas where land has previously been modified for yards and driveways.

Approximately 5,500 feet of the sewer route passes through areas that have been identified as potential wetlands. It is anticipated that wetland impacts associated with the project will be temporary impacts associated with utility installation. Therefore, no wetland mitigation requirement is anticipated. Wetland delineation and permitting will be completed for all proposed impacts as required by the Michigan Department of Environmental Quality.

Figure 1 – Site Location and Project Limits



C. POPULATION TRENDS

The proposed project area will serve 212 existing homes and private cabins, 3 resorts, a fire hall, State Park Headquarters and a State Park with 130 campsites. These 218 users represent approximately 262 equivalent domestic units (EDUs). See the User Map in Appendix B for the customer layout.

2010 U.S. Census data indicates that the population of Bergland Township is 467 persons, with 246 occupied housing units. The reported median household income for Bergland Township is $33,681.

2010 U.S. Census data indicates that the population of Marenisco Township is 254 persons, with 113 occupied housing units. The reported median household income for Marenisco Township is $34,643.

There are no available population projections for either township for the planning period. However, population projections for both Ontonagon County and Gogebic County are generally trending downward.

There is no anticipation of growth in the project area since the area around the lake is well-developed. However, there are several vacant lots in the project area that will require sewerage if developed. They will be able to tap into the proposed Low Pressure Sewer System at their own expense, without the need for expansion or re-sizing of sewer mains.

D. COMMUNITY ENGAGEMENT

The Authority will hold public meetings throughout the planning process to explain the proposed project. Project costs and funding strategies will be discussed in detail. Newspaper articles and press releases will cover the project in detail beginning with potential project funding.

SECTION 2: EXISTING FACILITIES

A. LOCATION MAP

There are no existing facilities within the project area. The location of the project area and the areas of proposed construction are shown on Figure 1.

B. HISTORY

In 2012, Bergland Township constructed the "Merriweather System" to address concerns of failing private septic systems around the north shore of Lake Gogebic. The Low Pressure Sewer System consists of 41,500 feet of HDPE force main, ranging in diameter from 1.25-inch to 6-inch, along with individual grinder pump stations at each residence or business. At the time, this Low Pressure Sewer System was considered to be a phase 1 of a construction plan that would ultimately see sewerage implemented around the entire lake. LGASA has since taken authority over sewerage around Lake Gogebic. The proposed LGASA Phase 1 system will be similar to the Merriweather system, and will discharge into an existing lift station of the Merriweather system (Lift Station #2) at the corner of Old M-28 and Hoop N Holler Rd.

Lift Station #2 uses two 77 gallon-per-minute pumps to convey sewage to the Bergland gravity sewer system through approximately 5,400 feet of 4-inch HDPE force main and approximately 11,200 feet of 6-inch HDPE force main. The Bergland gravity system, constructed in 1972, uses 8-inch ABS truss pipe to convey sewage to Lift Station #1.

Lift Station #1 was upgraded with new pumps, fittings and controls under the Merriweather project. The two 150 gallon-per-minute pumps convey raw sewage to the treatment lagoon system through 6,550 feet of 6-inch ductile iron forcemain. The lagoon system consists of three lagoon cells; the storage volume of each of the cells is 6,000,000 gallons. A bathymetric survey will be completed May 2018 and will provide accurate sludge depth and lagoon storage data. Previous sludge sampling indicated that the there was an average of 1.5 feet of accumulated sludge in Cell 1, and less than one foot of sludge in Cells 2 and 3.

The Bergland system (both the gravity system and the pressurized Merriweather system) operates under NPDES permit number MIG580330 and discharges through Outfall 001 to the Ontonagon River in the NE1/4, SW1/4, Section 3, T48N • R42W in Ontonagon County. This facility is in full compliance with its NPDES permit. All components of the existing system have been well maintained and are in good condition.

Marenisco Township operates its own gravity sewer system, which currently services 166 residential users and 12 commercial users. The system is comprised of 25,170 feet of gravity main, 7,550 feet of force main, two lift stations and a two-cell sewage treatment lagoon. However, this system is approximately 9.8 miles from the nearest connection point of the proposed LGASA system and is less feasible to serve the west shore of Lake Gogebic.

C. CONDITION OF FACILITIES

The existing wastewater collection and treatment system described in the previous section has been well maintained.

Wastewater is collected by a combination of gravity mains and pressurized force mains, and transported to the lagoon system through Lift Station #1. This lift station is equipped with two 150 gallon-per-minute pumps. The pump station was upgraded with new piping and valves prior to construction of the Merriweather system.

A recent Condition Assessment under the Michigan DEQ "SAW" program has indicated that infiltration and inflow are not problems within the existing gravity collection system.

The lagoon system is discharged seasonally and consistently meets all discharge conditions of the Township's NPDES permit.

Additionally, there is adequate conveyance capacity within the existing gravity system to accommodate the proposed project. However, as described previously, new lagoon cells will need to be constructed to provide adequate treatment and storage capacity.

D. FINANCIAL STATUS OF EXISTING FACILITIES

The existing facilities are owned and operated by Bergland Township, thus there are no existing financial obligations for Lake Gogebic Area Sewer Authority for the existing facilities.

E. WATER/ENERGY/WASTE AUDITS

No water, energy or waste audits have been conducted.

SECTION 3: NEED FOR PROJECT

A. HEALTH, SANITATION AND SECURITY

Lakefront property has become increasingly desirable in the Upper Peninsula of Michigan during the 46 years since the Bergland system was constructed. Consequently, there has been considerable development within the project service area during that time, especially prior to the enactment of the Bergland Township Zoning Ordinance.

Many of these developed properties are served by inadequate septic systems or privies. This has contributed to the potential for lake pollution and to public health concerns relating to septage discharge to the environment for the following reasons:

- Lot sizes are small and replacement systems are limited by the unavailability of adequate land for subsurface disposal systems.
- High groundwater levels in the area near the lake require mound-type systems which are expensive to construct and have a limited life span. This has contributed to substandard systems being under-reported.
- Privies exist in low lying areas adjacent to the lake, resulting in human waste being deposited near or within ground water.

The Western Upper Peninsula District Health Department issued a letter in 2009 that supports the goals of this project. A copy of this letter is provided in Appendix H. The letter states that over 90 percent of the disposal systems in the service area were constructed without permits, have exceeded their useful life spans, and that most of them lack the ability to adequately treat wastewater. The letter further states that replacement of these aged and failing systems is difficult or impossible due to site constraints.

B. SYSTEM OPERATIONS & MAINTENANCE

The Lake Gogebic Area Sewer Authority will own, operate and maintain the proposed new system. This system will be an independent sewer service district and will be funded separately from the existing Bergland/Merriweather system in which it discharges.

C. GROWTH

Significant growth is not anticipated within or adjacent to the project area, due to the area being nearly fully developed. A few vacant lots are present, which will be considered as potential users in regard to calculations for lagoon and lift station capacities.

Pressure sewer systems have limited expansion potential once constructed, since forcemain design needs to consider both friction loss and cleansing velocity within the pipe. Therefore, if too large a pipe is installed, the velocity within the pipe will not be adequate to prevent settling of solids and subsequent clogging. There will be a limited amount of expansion capability in the proposed system because of the fact that certain pipe sizes, such as 2.5-inch diameter and 5-inch diameter are not commonly manufactured and therefore, are more expensive than the next larger size. It is anticipated that this will allow for limited growth within the service area.

Due to the limitations on expansion of Low Pressure Sewer systems, the proposed Phase I project is not intended to have any future extensions, even though it is anticipated that sewer service will eventually be provided along the entire shoreline of Lake Gogebic. If and when such service is provided, those systems will be served by an entirely separate collection system with fee structures that are independent of the Phase I system.

SECTION 4: ALTERNATIVES CONSIDERED

A. DESCRIPTION

Three alternatives have been considered in preparation of this report. They include:

1. No Action

This alternative does not address any health or safety issues.

In this scenario, private on-site waste treatment systems would remain in place, many of which are currently failing, have been constructed without permits, and/or have been constructed in inadequate soil conditions. Over time, all private on-site waste treatment systems reach the end of their life expectancy and will contribute to the problem of inadequate sewage treatment in this lakefront area. Western Upper Peninsula District Health Department regulations indicate that soil conditions in this area typically require private on-site replacements be a mound-type installation. These systems are land intensive, expensive, and have limited life expectancies. Replacing failing systems with additional on-site systems would be a temporary solution to a long-term problem. Therefore, this option will not be further developed in this report.

Costs were not developed for this alternative, as there is no direct cost to the applicant. However, the aggregated monetary cost for the replacement of failed systems throughout the proposed service area is considerable.

2. Low Pressure Sewer System

Low Pressure Sewer systems (LPSS) typically consist of small grinder pump stations installed at individual structures or at small clusters of structures. These pumping stations are fitted with small (1 horsepower) pumps that have a grinding mechanism built into them. These pumps operate off of single phase residential power feeds. Typically, these pumping stations are connected to the electrical panel of the structure that is served by the pump.

The pumps discharge through 1.25-inch pipes to the low pressure collection system. Check valves prevent sewage from back flowing from the collection system to the individual pumping chambers. The pressurized nature of this system allows for sewer mains to follow the gradient of the landscape, rather than needing to "flow downhill" as in a typical gravity system. This allows for less excavation, which is especially desirable since shallow bedrock is expected to be encountered in certain areas within the project.

3. Gravity Sewer System

This alternative provides wastewater collection and treatment to properties within the service area using conventional sewer construction, bringing the system into full regulatory compliance.

Because of the topography of the service area, properties along the lakeshore would all still require individual grinder pump stations and low-pressure service lines. These pressurized service lines would then discharge into a gravity-fed sewer main constructed in M-64 right-of-way. The gravity mains would require deep excavation along with a high number of conventional sewage lift stations and manholes.

B. DESIGN CRITERIA

1. General

For alternatives 2 and 3, the project will be designed to RUS Design Policies (7CFR 1780.57), Ten States Standards, and Michigan DEQ requirements.

2. Alternate 2 – Low Pressure Sewer System

The collection system is comprised of small-diameter plastic pipe. In this system the pipes would range from 1.25-inch diameter up through 6-inch diameter. The system is laid out in a tree-type configuration with no loops (Appendix C). There are no requirements for uniform downward gradients in the collection system. In fact, collection pipes can be laid uphill. Therefore, pipes are laid along the surface gradient with the only requirement being that they are buried deep enough to prevent freezing.

Design considerations in sizing the collection mains are twofold. Pipes must be large enough to prevent the formation of excessive pressure heads, and they must be small enough to ensure that adequate fluid velocity exists (greater than 2 feet per second). This prevents settling of solids and consequent pipe clogging. Additionally, a velocity of 3.5 feet per second is recommended to re-suspend solids that have settled within the pipeline. This can be accomplished by placing flushing stations at strategic locations. The flushing stations will be operated periodically, especially during low-flow conditions.

Typically, the mains are constructed of Polyvinyl Chloride (PVC) or High-Density Polyethylene (HDPE) pipe. HDPE pipe has the advantage that it can be fabricated in long sections on the ground surface by fusion welding the segments together and placed in excavated trenches or installed by directional drilling techniques without the need for trench excavation.

3. Alternate 3 – Gravity Sewer System

For the gravity sewer system alternative, sewer mains will be laid at a constant line and grade between pre-cast concrete manholes. The minimum sewer pipe size will be 8-inch diameter. Sewage lift stations will be placed at strategic locations dictated by topography and by excavation concerns. In general, lift stations will be placed to avoid pipeline excavation in excess of 25 feet deep.

When conventional sewage pumps are used, the minimum allowable force main size is 4-inch diameter. Pumps will be sized based on sewage wet well retention time as well as the requirement to maintain a 2-foot per second pipeline scouring velocity.

C. MAP

See Figure 1 for the overall site location and project area. See Appendix B for the User Map and Appendix C for the pump locations for the low pressure sewer alternative.

D. ENVIRONMENTAL IMPACTS

1. Short-Term Negative Impacts

Anticipated short-term negative impacts will result from noise, fugitive dust exposure of soils and soil erosion during construction of the proposed alternatives. It is expected that good construction practices and local erosion control regulations will minimize the adverse effects to residents and the environment.

2. Short-Term Positive Impacts

Anticipated short-term positive impacts will result in the employment opportunity for construction workers during the duration of the proposed project. Local merchants, motels and other businesses may see an increase in revenue due to the labor pool used on the project.

3. Long-Term Negative Impacts

The long-term negative impacts that would result from the alternatives are minor, with the exception of the "No Action" Alternative.

4. Long-Term Positive Impacts

Long-term positive impacts will result in a safer, more reliable wastewater collection system. The majority of the work will be constructed underground in established right-of-way. Therefore, it should not adversely affect the land use of adjacent property owners.

E. LAND REQUIREMENTS

The proposed improvements will be located within owner lands and established easements or street right-of-way. New easements will be required from prospective customers in order to install the pumping stations, connect the pump stations to the existing service leads, and to connect the electricity and control panels to the customer structures.

Land for the new lagoon cell will need to be purchased from Bergland Township in order to construct the new lagoon adjacent to the existing lagoons. The total land area required is 5.5 acres, which includes the 312-ft x 586-ft lagoon cell and a 30-foot buffer on all sides. The estimated cost of this land is $1,000 per acre, for a total estimated cost of $5,500. Budget for this land is included in the Engineer's estimate.

F. POTENTIAL CONSTRUCTION DIFFICULTIES

Two conditions may tend to add difficulty to this project: groundwater and ledge rock. With the project's proximity to Lake Gogebic, high ground water is anticipated in the project area. If high ground water is encountered, it will be controlled with a dewatering system, and under Alternative 2, by the use of directional drilling methods. Secondly, shallow ledge rock was encountered on the north shore of the lake during construction of the Merriweather system in 2012. In the event that ledge rock is encountered during proposed construction of the new system, Alternative 2 would allow for directional drilling through the rock. This would alleviate the need for rock excavation or blasting. Soil borings will be performed during design to identify rock depths.

G. SUSTAINABILITY CONSIDERATIONS

1) Water and Energy Efficiency

   There are no direct cost reductions related to water and energy efficiency for this project; environmental degradation is the driving force. Without the improved sewerage, long-term energy costs related to environmental remediation would be considerable.

2) Green Infrastructure

   Not applicable.

3) Other aspects of Sustainability

   The No-Action Alternative is not sustainable in the long-term. At some point, the failing septic systems must be addressed to prevent long-term environmental degradation to the lake and surrounding wetland areas.

H. COST ESTIMATES

Brief cost estimates for each of the alternatives listed in Section 4 are shown below. Appendix E has detailed estimates for each of the construction alternatives.

1. No Action:

The "No Action" option does not address health and safety issues. There is no direct cost to the owner for this alternative.

2. Low Pressure Sewer System:

The estimated cost of a Low Pressure Sewer System is $10,010,964.

3. Gravity Sewer System:

The estimated cost of a Gravity Sewer System is $14,859,290.

I. ADVANTAGES / DISADVANTAGES

Alternatives 2 and 3 will bring the service area into compliance with environmental regulations. Alternative 1 will not.

Alternative 2 has the advantage of less excavation being required to install a new system, lower construction costs, and lower annual costs.

SECTION 5: SELECTION OF AN ALTERNATIVE

A. LIFE CYCLE COST ANALYSIS

The Authority has evaluated the advantages and disadvantages of each of the wastewater system alternatives using the following Present Worth Analysis matrix shown in Table 1. Alternative 2 is the preferred option.

Table 1: Present Worth Analysis

Alternative	**1**	**2**	**3**
Description	No Action	Low Pressure Sewer System	Gravity Sewer System
Does Alternate Address Problem?	NO	YES	YES
Annual O&M Costs			
USDA Debt Reserve*	$ 0	$ 74,107	$ 109,989
Annual O&M Costs	$ 0	$ 52,340	$ 52,340
Short-Lived Depreciation	$ 0	$ 11,000	$ 25,000
Total Annual Costs	$ 0	$ 137,447	$ 187,329
Present Worth of Annual Costs	$ 0	$ 2,083,200	$ 2,839,231
Estimated Project Costs	$ 0	$ 10,010,964	$ 14,859,290
Salvage Value	$ 0	$ 0	$ 0
Present Worth	$ **0**	**$ 12,094,164**	**$ 17,698,521**

*Debt Reserve based on 6.00% interest rate

B. NON-MONETARY FACTORS

Environmental quality is of the utmost concern. Allowing the lakeshore properties to remain without proper sewerage is not practical or desirable, since poor water quality will affect many more people than just those with properties on the Lake.

SECTION 6: PROPOSED PROJECT

A. PRELIMINARY PROJECT DESIGN

The selected project consists of installing small-diameter pressurized mains. Layout is shown in Appendix C. These mains will range in size from 1.25-inch through 6-inch diameter. Each structure will be connected to a small grinder pump station and these stations will discharge to the pressurized main system through 1.25-inch service lines. The pressurized main will discharge into an existing lift station and through an existing sewer network to the Bergland Township wastewater lagoon system.

A pressure sewer calculation table is included in Appendix D: Wastewater System Modeling Calculations – E-One Design Assistant.

B. PROJECT SCHEDULE

The following is a list of potential dates for submittal and anticipated approval of all required documents, land and easement acquisition, permit applications, advertisements for bids, loan closing, contract award, initiation of construction, substantial completion, final completion, and initiation of operation.

1. Letter of Eligibility from RD	September 2018
2. Obligation/Letter of Conditions	November 2018
3. Project Design	December 2018 – March 2019
4. Permits and RD Approval	April 2019
5. Project Contractor Bids	April 2019
6. Loan Closing	April 2019 – May 2019
7. Project Construction	May 2019 – November 2019

C. PERMIT REQUIREMENTS

The following is a list of permits that may be required as a result of this project.

1. MDEQ Permit for Wastewater Systems;
2. MDEQ Wetland Permit;
3. NPDES Permit for Additional Effluent Discharge;
4. MDEQ Stormwater Permit;
5. MDEQ/USACE Joint Permit Application
6. SESC Permit – Ontonagon & Gogebic Counties
7. CN Railroad Crossing Insurance/Permit

D. SUSTAINABILITY CONSIDERATIONS

1) Water and Energy Efficiency

There are no direct cost reductions related to water and energy efficiency for this project; environmental degradation is the driving force. Without the improved sewerage, long-term energy costs related to environmental remediation would be considerable.

2) Green Infrastructure

Not applicable

3) Other Aspects of Sustainability

The No-Action Alternative is not sustainable in the long-term. At some point, the failing septic systems must be addressed to prevent long-term environmental degradation to the lake and surrounding wetland areas.

E. TOTAL PROJECT COST ESTIMATE

Table 2: Alternative 2 Cost Estimate*

Item	Quantity	Units	Units Price	Cost
1 1/4" Service Pipe	78,850	LF	$35.00	$2,759,750.00
1 1/4" Service – Bored Under M-28	11	Each	$4,400.00	$48,400.00
1 1/2" Main Line Pipe	1,700	LF	$17.00	$28,900.00
2" Main Line Pipe	700	LF	$18.00	$12,600.00
3" Main Line Pipe	2,300	LF	$23.00	$52,900.00
4" Main Line Pipe	5,450	LF	$23.50	$128,075.00
5” Main Line Pipe	14,010	LF	$25.15	$352,351.50
6" Main Line Pipe	29,660	LF	$25.15	$745,949.00
Grinder Pump Station	230	Each	$4,515.00	$1,038,450.00
Electrical Connection	10,000	LF	$7.50	$75,000.00
Service Line Connection	230	Each	$1,100.00	$253,000.00
Air Relief and Flushing Station	32	Each	$4,640.00	$148,480.00
Flushing Station	40	Each	$3,125.00	$125,000.00
Lift Station	2	Each	$226,800.00	$453,600.00
Lagoon Cell	1	Lump	$516,000.00	$516,000.00
Clearing	8.0	Acre	$6,500.00	$52,000.00
Rock Excavation	1500	CY	$125.00	$187,500.00
Earth Excavation	20,600	CY	$7.00	$144,200.00
MDOT 23A Gravel	15,000	SY	$7.00	$105,000.00
Erosion Control	1	Lump	$48,000.00	$48,000.00
Restoration	1	Lump	$90,000.00	$90,000.00
Land and Miscellaneous Items				$346,535.00
	Construction Subtotal			$7,711,690.50
Administrative and Legal Expenses				$140,000.00
Engineering and Inspection				$1,388,104.29
Contingencies				$771,169.05
CONSTRUCTION TOTAL				**$10,010,963.84**
CAPITALIZED INTEREST				**$ 990,180.00**
PROJECT TOTAL (rounded to nearest dollar)				**$11,001,144.00**

*A detailed cost estimate is provided in Appendix E.

F. ANNUAL OPERATING BUDGET

1. PROJECTED INCOME

There is no water supply system in the service area of the proposed project, therefore a rate structure based on metered usage is not feasible. The projected income is based on a flat-rate structure, with residential and commercial users each paying $279.43 per EDU monthly. This rate structure is based on a no-grant scenario, with the project fully-funded by a 40-year loan at 6% interest. Tables 6 and 7 shows other funding scenarios with various grant amounts, for both 4% and 6% interest rates.

Table 3 provides the projected income.

Table 3: Projected Income

PROPOSED RATE - $279.43 per EDU

Residential (1 EDU per Each)		
212 Customers	212	$59,239.16
Commercial		
West Shore Resort (8 cabins)	4.0	$1,117.72
Fishtales Resort (6 cabins, cottage, lodge)	5.0	$1,397.15
Gogebic Lodge (12 cabins, 1 lodge)	7.0	$1,956.01
Lake Gogebic State Park (126 campsites)	32.0	$8,941.76
Government		
Lake Gogebic Fire Department	1.0	$279.43
State Park Headquarters	1.0	$279.43
Monthly Income	262	$73,210.66
Yearly Income		$878,527.92

2. OPERATION AND MAINTENANCE COSTS

The breakdown of the annual estimated Operation and Maintenance (O&M) costs are listed below in Table 4. Estimated costs shown here are based on the Profit & Loss Budget Overview for Bergland Township for FY 2015-2016 and FY 2016-2017. The budget overview is included as Appendix A.

Table 4 – O&M Costs

Expenditure	**O&M Cost Proposed System**
Salary Costs	$12,110
FICA	1,000
Accounting	6,000
Advertising	500
Lab Fees	500
Office Rental	2,500
Office Supplies	1,600
Operating Supplies	4,300
Discharge Permit	520
Repair and Maintenance	3,000
Audit Fees	2,500
Training & Conferences	500
Utilities	3,200
Vehicles Expense	3,750
Insurance	3,000
Legal Fees	500
Travel Expenses	360
Miscellaneous	5,000
Contingency	1,500
TOTAL	**$52,340**

3. DEBT REPAYMENT

The proposed new sewer service district will be funded such that all costs associated with the district be borne only by the users of the proposed new district. Fees will not be increased for users of the existing Bergland or Merriweather Systems.

All costs associated with bonding for the improvement, including principal, interest and debt service reserve, will be paid for exclusively by the new users. Consequently, the first three (3) interest payments will be capitalized and bonds will be structured so that the principal payments are deferred for two (2) years (i.e. one deferred payment). This will allow for the fact that it will be 18 to 24 months following loan closure before full revenues are realized.

If no grant funds are secured for a project cost of $10,010,964, a $11,001,200 loan will be required to allow for capitalized interest (assuming 6% interest rate). The debt repayment on a 40-year loan for this amount with one (1) deferred principal payment would be $741,074 annually. The additional 10 percent debt reserve account would increase the bond and reserve requirement by $74,107 to $815,181.

Factoring in operation, maintenance and short-lived depreciation, total estimated annual expenses amount to $878,521.

If a 75% grant is secured for a project cost of $10,010,964, the loan amount with 6 percent interest would be $2,751,000. The debt repayment on a 40-year loan with one (1) deferred principal payment would be $185,302 annually. The additional 10 percent debt reserve account would increase the bond and reserve requirement by $18,530 to $203,832. With O&M and short-lived depreciation, the total annual expenses would amount to $267,172.

Additional funding options are shown in Tables 6 & 7. These options include various grant amounts at 6% interest (Table 6) and 4% interest (Table 7).

4. RESERVES

- Debt Service Reserve - The project reserve account on the debt retirement as stated above would be 10 percent of $741,074, or $74,107, if no grant funds are obtained.

- Short-Lived Depreciation – Short-lived depreciation is calculated in Table 5 on the following page.

Table 5 – Short Lived Depreciation

Item	Life-Expectancy	Replacement	Annual Depreciation
Proposed System Items			
230 Pump Cores	14 Years	$140,000	$10,000
Lift Station Pumps	10 Years	$ 10,000	$ 1,000
Total Short-Lived Depreciation Per Year			**$11,000**

5. USER CHARGE ANALYSIS

Tables 6 and 7 on the following pages are an estimate of the sewer project's annual financing for 0 percent, 25 percent, 50 percent and 75 percent grants. Table 6 shows a 6% interest rate, while table 7 shows 4% interest. The tables also develop user charges for the LGASA Phase I system based on the various grant and interest scenarios. The two interest rate scenarios are presented since it is unknown at this time what the actual interest rate will be.

Table 6: User Charge Analysis – 6% Interest Rate

LAKE GOGEBIC AREA SEWER AUTHORITY
PHASE I SEWER PROJECT
USER CHARGE ANALYSIS* - 6% INTEREST RATE

	Percent Grant			
CAPITAL COSTS (1)	0%	25%	50%	75%
CONSTRUCTION	$7,711,691	$7,711,691	$7,711,691	$7,711,691
ENGINEERING, LEGAL, ADMINISTRATION, EASEMENTS, CONTINGENCIES, ETC.	$2,299,273	$2,299,273	$2,299,273	$2,299,273
CONSTRUCTION TOTAL	$10,010,964	$10,010,964	$10,010,964	$10,010,964
CAPITALIZED INTEREST (from below)	$990,180	$742,590	$495,090	$247,590
TOTAL FUNDS NEEDED	$11,001,144	$10,753,554	$10,506,054	$10,258,554
GRANT/LOAN AMOUNTS				
GRANT	$0	$2,502,741	$5,005,482	$7,508,223
USDA-RD LOAN (2)	$11,001,144	$8,250,813	$5,500,572	$2,750,331
REQUIRED BOND TO CAPITALIZE THREE INTEREST PAYMENTS AND DEFER ONE PRINCIPAL PAYMENT				
Date of Issue	5/1/2020	5/1/2020	5/1/2020	5/1/2020
Interest Rate:	6.000%	6.000%	6.000%	6.000%
Yrs Deferred Principle	2	2	2	2
Loan Funding Needed for Construction:	$11,001,144	$8,250,813	$5,500,572	$2,750,331
Principal from Bond (round to nearest $1000):	$11,002,000	$8,251,000	$5,501,000	$2,751,000
- Three Interest Payments	$990,180	$742,590	$495,090	$247,590
= Funds Available for construction	$10,011,820	$7,508,410	$5,005,910	$2,503,410
Balance (+favorable / - unfavorable)	$856	$187	$428	$669
Amort. Factor	0.0674	0.0674	0.0674	0.0674
Amortized Payment:	$741,074	$555,772	$370,537	$185,302

	Percent Grant			
USER CHARGE SCENARIO	0%	25%	50%	75%
ANNUAL LOAN PAYMENT (3)	$741,074	$555,772	$370,537	$185,302
ANNUAL USDA-RD RESERVE AMOUNT	$74,107	$55,577	$37,054	$18,530
ANNUAL O&M EXISTING SYSTEM	$0	$0	$0	$0
ANNUAL O&M PROPOSED SYSTEM	$52,340	$52,340	$52,340	$52,340
SHORT LIVED DEPRECIATION EXISTING SYSTEM	$0	$0	$0	$0
SHORT LIVED DEPRECIATION PROPOSED SYSTEM	$11,000	$11,000	$11,000	$11,000
TOTAL ESTIMATED ANNUAL EXPENSES	$878,521	$674,689	$470,931	$267,172
REVENUE FROM EXISTING USERS	$0	$0	$0	$0
YEARLY REVENUE REQUIRED FROM NEW USERS	$878,521	$674,689	$470,931	$267,172
MONTHLY REVENUE REQUIRED FROM NEW USERS	$73,210	$56,224	$39,244	$22,264
EDUs NEW SYSTEM	262	262	262	262
MONTHLY CHARGE PER EDU	$279.43	$214.60	$149.79	$84.98

Table 7: User Charge Analysis – 4% Interest Rate

LAKE GOGEBIC AREA SEWER AUTHORITY
PHASE I SEWER PROJECT
USER CHARGE ANALYSIS* - 4% INTEREST RATE

	Percent Grant			
CAPITAL COSTS (1)	0%	25%	50%	75%
CONSTRUCTION	$7,711,691	$7,711,691	$7,711,691	$7,711,691
ENGINEERING, LEGAL, ADMINISTRATION, EASEMENTS, CONTINGENCIES, ETC.	$2,299,273	$2,299,273	$2,299,273	$2,299,273
CONSTRUCTION TOTAL	$10,010,964	$10,010,964	$10,010,964	$10,010,964
CAPITALIZED INTEREST (from below)	$639,000	$479,280	$319,500	$159,780
TOTAL FUNDS NEEDED	$10,649,964	$10,490,244	$10,330,464	$10,170,744
GRANT/LOAN AMOUNTS				
GRANT	$0	$2,502,741	$5,005,482	$7,508,223
USDA-RD LOAN (2)	$10,649,964	$7,987,503	$5,324,982	$2,662,521
REQUIRED BOND TO CAPITALIZE THREE INTEREST PAYMENTS AND DEFER ONE PRINCIPAL PAYMENT				
Date of Issue	5/1/2020	5/1/2020	5/1/2020	5/1/2020
Interest Rate:	4.000%	4.000%	4.000%	4.000%
Yrs Deferred Principle	2	2	2	2
Loan Funding Needed for Construction:	$10,649,964	$7,987,503	$5,324,982	$2,662,521
Principal from Bond (round to nearest $1000):	$10,650,000	$7,988,000	$5,325,000	$2,663,000
- Three Interest Payments	$639,000	$479,280	$319,500	$159,780
= Funds Available for construction	$10,011,000	$7,508,720	$5,005,500	$2,503,220
Balance (+favorable / - unfavorable)	$36	$497	$18	$479
Amort. Factor	0.0516	0.0516	0.0516	0.0516
Amortized Payment:	$549,880	$412,436	$274,940	$137,496

	Percent Grant			
USER CHARGE SCENARIO	0%	25%	50%	75%
ANNUAL LOAN PAYMENT (3)	$549,880	$412,436	$274,940	$137,496
ANNUAL USDA-RD RESERVE AMOUNT	$54,988	$41,244	$27,494	$13,750
ANNUAL O&M EXISTING SYSTEM	$0	$0	$0	$0
ANNUAL O&M PROPOSED SYSTEM	$52,340	$52,340	$52,340	$52,340
SHORT LIVED DEPRECIATION EXISTING SYSTEM	$0	$0	$0	$0
SHORT LIVED DEPRECIATION PROPOSED SYSTEM	$11,000	$11,000	$11,000	$11,000
TOTAL ESTIMATED ANNUAL EXPENSES	$668,208	$517,019	$365,774	$214,585
REVENUE FROM EXISTING USERS	$0	$0	$0	$0
YEARLY REVENUE REQUIRED FROM NEW USERS	$668,208	$517,019	$365,774	$214,585
MONTHLY REVENUE REQUIRED FROM NEW USERS	$55,684	$43,085	$30,481	$17,882
EDUs NEW SYSTEM	262	262	262	262
MONTHLY CHARGE PER EDU	$212.54	$164.45	$116.35	$68.26

SECTION 7: CONCLUSIONS AND RECOMMENDATIONS

The proposed LGASA Phase I Sewer Project will correct health, sanitation and pollution concerns in the service area. As the preliminary design indicates, the proposed improvements will alleviate these concerns by replacing privately owned septic tank/subsurface wastewater infiltration systems and privies with a modern wastewater collection system and sewage treatment.

Based on the findings of this report, the following recommendations are offered:

1) Review the report and submit a copy to the MDEQ for approval and to USDA-Rural Development (RD) for concurrence.

2) Submit the report to RD as part of the application for a funding package.

3) Upon RD approval and LGASA acceptance of funding terms, the remaining financial assistance items shall be completed and elements of this preliminary design be incorporated into the final design phase.

4) If the financial ramifications of the project scope contained herein cannot be found acceptable by LGASA, additional investigation into amending the project scope should be initiated.

APPENDICES

APPENDIX A: Bergland Township Budget Overview

SEWE
Profit & Los
Accrual Basis — April 2015

	TOTAL Apr '15 - Mar 16	
Income		
642 Bergland User Fees		36,000.00
643 Merriweather User Fees		107,000.00
643 MWR User Fees		0.00
664 Interest		550.00
676 Due from other funds		
676.1 MWR Due from other funds	0.00	
676 Due from other funds - Other	0.00	
Total 676 Due from other funds		0.00
694 Other Revenue		
694.1 MWR Other Revenue	0.00	
694 Other Revenue - Other	7,000.00	
Total 694 Other Revenue		7,000.00
Total Income		150,550.00
Expense		
702 Wages - Tom		
702.1 MWR wages - Tom	4,700.00	
702 Wages - Tom - Other	4,700.00	
Total 702 Wages - Tom		9,400.00
703 Salary Billing Clk		
703.1 MWR salary billing clerk	950.00	
703 Salary Billing Clk - Other	950.00	
Total 703 Salary Billing Clk		1,900.00
705 Helper Wage		450.00
705.1 Helper Wage		450.00
715 Employer FICA		
715.1 MWR Employer FICA	750.00	
715 Employer FICA - Other	750.00	
Total 715 Employer FICA		1,500.00
727 Office Supplies		
727.1 MWR Office Supplies	0.00	
727.2 Stamps/Postage		
727.21 MWR stamps and postage	525.00	
727.2 Stamps/Postage - Other	275.00	
Total 727.2 Stamps/Postage	800.00	
727 Office Supplies - Other	0.00	
Total 727 Office Supplies		800.00
728 Postage		0.00

SEWER FUN
Profit & Loss Bu
Accrual Basis — April 2015 throug

	TOTAL Apr '15 - Mar 16	
728.1 MWR postage		0.00
740 Operating Supplies		
740.1 MWR Operating supplies	2,000.00	
740 Operating Supplies - Other	2,300.00	
Total 740 Operating Supplies		4,300.00
801 Contract worker		
801.1 MWR Contract worker	1,900.00	
801 Contract worker - Other	1,900.00	
Total 801 Contract worker		3,800.00
802 Legal fees		
802.2 MWR Legal fees	500.00	
802 Legal fees - Other	500.00	
Total 802 Legal fees		1,000.00
803 DISCHARGE PERMIT		
803.1 MWR Discharge permit	0.00	
803 DISCHARGE PERMIT - Other	0.00	
Total 803 DISCHARGE PERMIT		0.00
804 Audit fees		
804.1 MWR Audit fees	1,250.00	
804 Audit fees - Other	1,250.00	
Total 804 Audit fees		2,500.00
850 Telephone		
850.1 MWR Telephone	0.00	
850 Telephone - Other	0.00	
Total 850 Telephone		0.00
860 Travel		
860.1 MWR Travel	100.00	
860 Travel - Other	0.00	
Total 860 Travel		100.00
900 Print/publish/ads		
900.1 MWR Print/publish/ads	50.00	
900 Print/publish/ads - Other	0.00	
Total 900 Print/publish/ads		50.00
920 Utilities		
920.1 MWR Utilities	1,600.00	
920 Utilities - Other	1,600.00	
Total 920 Utilities		3,200.00

SEWER FUND CLERK
Profit & Loss Budget Overview
April 2015 through March 2016

Accrual Basis

	TOTAL Apr '15 - Mar 16
930 Repair/Maint.	
930.1 MWR Repair/maintenance	1,500.00
930 Repair/Maint. - Other	1,500.00
Total 930 Repair/Maint.	3,000.00
941 Office Rental	
941.1 MWR Office rental	1,250.00
941 Office Rental - Other	1,250.00
Total 941 Office Rental	2,500.00
950 insurance	
950.1 MWR Insurance	1,850.00
950 insurance - Other	1,850.00
Total 950 insurance	3,700.00
956 Training Conference	
956.1 MWR Training conference	150.00
956 Training Conference - Other	150.00
Total 956 Training Conference	300.00
957 Misc. Expense	
957.1 MWR Misc. Expense	600.00
957 Misc. Expense - Other	600.00
Total 957 Misc. Expense	1,200.00
967.1.1 MWR Bond Reserve Acct.	15,200.00
967.1.2 MWR RRI (206805)	9,300.00
992 Loan Principal Paid	
992.1 MWR Loan Principal Paid	33,000.00
992 Loan Principal Paid - Other	2,900.00
Total 992 Loan Principal Paid	35,900.00
995 Loan Interest Paid	
995.1 MWR Loan Interest Paid	49,005.00
995 Loan Interest Paid - Other	0.00
Total 995 Loan Interest Paid	49,005.00
999 Transfer to other funds	
999.1 MWR Trans to other funds	0.00
999 Transfer to other funds - Other	0.00
Total 999 Transfer to other funds	0.00
Depreciation Expense	0.00
Loan Principle Paid	0.00
Reconciliation Discrepancies	0.00
VOID	0.00

	TOTAL Apr '15 - Mar 16
Total Expense	149,555.00
Net Income	**995.00**

WATER FUND - CLERK
Profit & Loss Budget Overview
April 2015 through March 2016

Accrual Basis

	TOTAL Apr '15 - Mar 16
Income	
642 User Fees	49,000.00
664 Interest	100.00
667 Hydrant Rental	2,000.00
694 Other Revenue	2,000.00
Total Income	53,100.00
Expense	
591-999 Due other funds	0.00
702 Salary - Tom	7,500.00
703 Salary - Billing Clk	1,800.00
705 Helper Wage	1,000.00
715 Employer FICA	1,300.00
727 Ofc. Supplies	
727.1 Software/Support	400.00
727 Ofc. Supplies - Other	200.00
Total 727 Ofc. Supplies	600.00
728 Postage	350.00
740 Operating Supplies	1,500.00
801 Contract Service	
801.1 Water Samples	750.00
801 Contract Service - Other	0.00
Total 801 Contract Service	750.00
802 Legal fees	100.00
804 Audit fees	2,000.00
810 Membership dues	300.00
900 Print/publish/ads	0.00
920 Utilities	5,500.00
930 Repair/Maint.	
930.2 Russ Nordine	1,000.00
930 Repair/Maint. - Other	2,000.00
Total 930 Repair/Maint.	3,000.00
941 Office Rental	2,500.00
950 insurance	1,600.00
952 depreciation	0.00
956 Training Conference	400.00
957 Misc. Exp.	2,150.00
967 Trans to Bond Rsrv.	1,100.00
967.1 Trans to Genl Purp	3,000.00
967.2 Trans to Swr Fd	0.00
992 Loan Principle Paid	5,800.00
995 Loan Interest Paid	2,000.00
999 Trans to other fund	7,130.00

	TOTAL Apr '15 - Mar 16
Total Expense	51,380.00
Net Income	**1,720.00**

SEWER BUDGET 2017		
INCOME		
Current Balance	127,940.05	
642 Bergland User Fees	36,870.60	
643 Merriweather User Fees	118,800.00	
644 Interest	55.00	
676 Due From Other Funds		
676.1 Mwr Due From Other Funds		
676 Due From Other Funds - Other		
694 Other Revenue		
694.1 Mwr Other Revenue		
694 Other Revenue - Other		
Total 694 Other Revenue	**$0.00**	
TOTAL INCOME	**$283,665.65**	
EXPENSE		
702 Wages - Wally	9,225.60	
702 Wages - Dean	2,880.00	
Total 702 Wages	**$12,105.60**	
703 Salary Billing Clerk		
703.1 Salary Clerk	1,700.00	
703.2 Salary Deputy Clerk	200.00	
703.3 Salary Treasurer	3,020.00	
703.4 Salary Deputy Treasurer	680.00	
705 Helper Wage	400.00	
715 Employer FICA	1,000.00	
Total 703 Billing Wage	**$7,000.00**	
727 Office Supplies		
727 Office Supplies	200.00	
727.1 Software-Cogitate	600.00	
Total 727 Office Supplies	**$800.00**	
728 Postage		
728.1 Mwr Stamps & Postage	500.00	
728.2 Stamps/Postage - Other	300.00	
Total 727.2 Stamps/Postage	**$800.00**	
740 Operating Supplies		
740.1 Mwr Operating Supplies	250.00	
740 Operating Supplies - Other	250.00	
740 Total Operating Supplies	**$500.00**	
801 Contract Worker	10,000.00	
Total 801 Contract Worker	**10,000.00**	

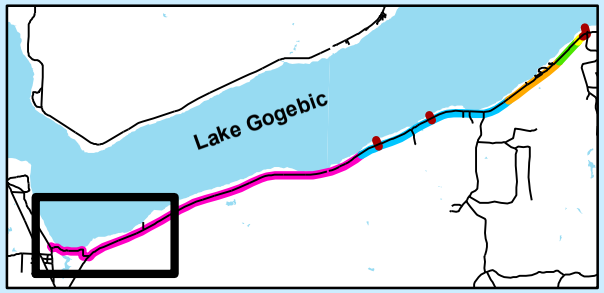
802 Legal Fees		
802.2 Mwr Legal Fees		
802 Legal Fees - Other		
Total 802 Legal Fees	**0.00**	
803 Discharge Permit	520.00	
Total 803 Discharge Permit	**520.00**	
804 Audit Fees	2,500.00	
Total 804 Audit Fees	**2,500.00**	
860 Travel		
860.1 Dean Travel	360.00	
860 Travel - Other		
Total 860 Travel	**360.00**	
900 Printing & Publishing & Ads	200.00	
Total 900 Printing & Publishing & Ads	**200.00**	
920 Utilities		
920.1 Mwr Utilities	500.00	
920 Utilities - Other	2,500.00	
Total 920 Utilities	**3,000.00**	
930 Repair & Maintenance	20,000.00	
Total 930 Repair & Maintenance	**20,000.00**	
941 Office Rental	2,500.00	
Total 941 Office Rental	**2,500.00**	
950 Insurance	3,000.00	
Total 950 Insurance	**3,000.00**	
956 Training Conference	1,000.00	
Total 956 Training Conference	**1,000.00**	
957 Miscellaneous Expense	5,000.00	
Total 957 Miscellaneous Expense	**5,000.00**	
967.1.1 Mwr Bond Reserve Acc't	15,200.00	
967.1.2 Mwr RRI (206805)	9,300.00	
Total Mwr Sewer Savings	**24,500.00**	

Merriweather Sewer Payments		
992.1 Mwr Loan Principal Paid	35,000.00	
995.1 Mwr Loan Interest Paid	47,497.50	
Total Merriweather Sewer Payments	**82,497.50**	
LGASA	5,000.00	
Total LGASA	**5,000.00**	
TOTAL EXPENSES	**$181,283.10**	
NET INCOME	**$102,382.55**	

WATER BUDGET 2017		
INCOME		
Current Balance	27,394.57	
642 User Fees	49,760.64	
664 Interest	100.00	
667 Hydrant Rental	2,000.00	
694 Other Revenue	2,500.00	
Total Income	**$81,755.21**	
EXPENSE		
591-000 Due to other funds	7,200.00	to General Fund
Total Due To Other Funds	**7,200.00**	
702 Salary (Wally)	5,654.00	
702 Salary (Dean)	1,920.00	
703 Salary - Billing Clerk	1,600.00	
703.2 Salary Deputy Clerk	100.00	
703.3 Salary Treasurer	1,510.00	
703.4 Salary Deputy treasurer	340.00	
705 Helper Wage	800.00	
715 Employer FICA	1,200.00	
Total Salary	**13,124.00**	
727 Office Supplies		
727.1 Software/Support	400.00	
727 Office Supplies-Other	300.00	
Total 727 Office Supplies	**$700.00**	
728 Postage	300.00	
Total 728 Postage	**300.00**	
740 Operating Supplies		
Total 740 Operating Supplies	**0.00**	
801 Contract Service		
801 Contract Service-Other		
801.1 Water Samples	540.00	
801.2 Cogitate		
801.3 Computer Service	200.00	
Total 801 Contract Service	**$740.00**	
802 Legal Fees		
Total 802 Legal Fees	**0.00**	
803 Discharge Permit		
Total 803 Discharge Permit	**0.00**	

804 Audit Fees	1,500.00	
Total 804 Audit Fees	**1,500.00**	
860 Travel (Dean)	240.00	
Total 860 Travel	**240.00**	
900 Printing/Publishing/Ads	50.00	
Total 900 Printing/Publishing/Ads	**50.00**	
920 Utilities	5,000.00	
Total 920 Utilities	**5,000.00**	
930 Repair/Maintenance		Pump house Roof ??
930.1 John Korich		
930.2 Russ Nordine	1,000.00	
930 Repair/Maint - Other	2,500.00	
Total 930 Repair/Maintenance	**$ 17,080.00**	
941 Office Rental	2,500.00	
Total 941 Office Rental	**2,500.00**	
950 Insurance	1,400.00	
Total 950 Insurance	**1,400.00**	
956 Training Conference	500.00	
Total 956 Training Conference	**500.00**	
957 Miscellaneous Expense	2,000.00	
Total 957 Miscellaneous Expense	**2,000.00**	
967 Transfer to Bond Reserve	1,000.00	
967.1 Transfer to General Purp	3,000.00	
Total 967 Transfers	**4,000.00**	
992 Loan Principal Paid	0.00	
995 Loan Interest Paid		
Total Loan Paid	**0.00**	
Payroll Expenses		
Total Payroll Expenses	**0.00**	
Total Expense	**$56,334.00**	
Net Income	**$25,421.21**	

APPENDIX B: User Map



Lift Station #2

Zone 15

See Sheet 2

1354 ft

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

User Location

6" Force Main

5" Force Main

4" Force Main

3" Force Main

2" Force Main

1.5" Force Main

0 500 1,000

Feet

1 inch = 1,250 feet

Project:	15440
Drawn:	MCH
Date:	4/11/2018
Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	1

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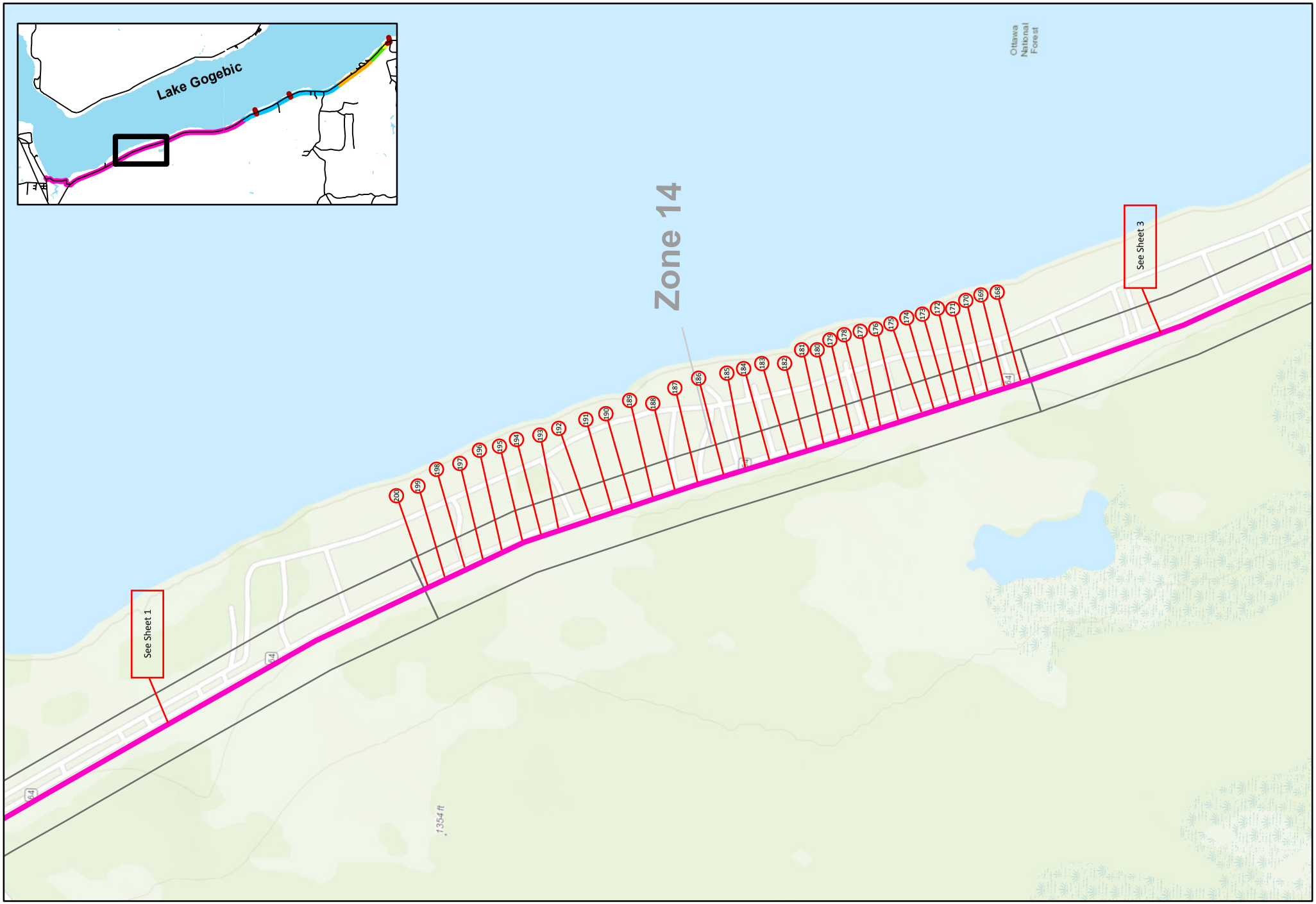

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

User Location

6" Force Main

5" Force Main

4" Force Main

3" Force Main

2" Force Main

1.5" Force Main

0 250 500

Feet

1 inch = 750 feet

Project:	15440
Drawn:	MCH
Date:	4/11/2018
Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	2

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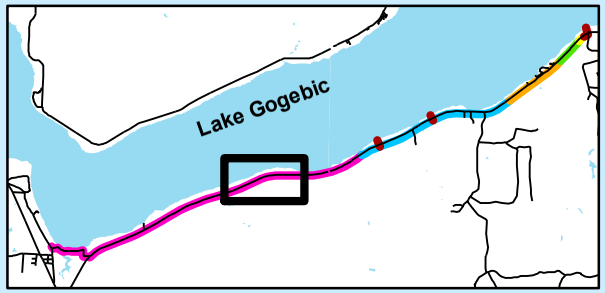

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

User Location

6" Force Main

5" Force Main

4" Force Main

3" Force Main

2" Force Main

1.5" Force Main

0 250 500

Feet

1 inch = 750 feet

Project:	15440
Drawn:	MCH
Date:	4/11/2018
Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	3

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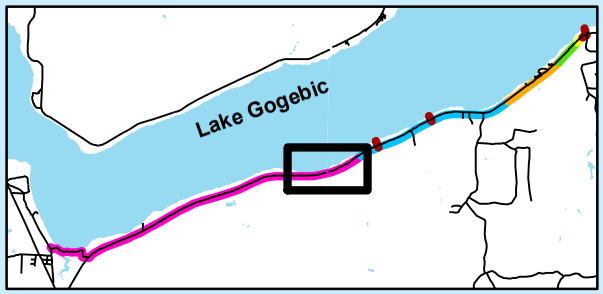

Zone 12

Zone 12

State Highway M64

State Highway M64

ONTONAGON GOGEBIC

Hendrick Creek

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

User Location

6" Force Main

5" Force Main

4" Force Main

3" Force Main

2" Force Main

1.5" Force Main

0 250 500

Feet

1 inch = 750 feet

Project:	15440
Drawn:	MCH
Date:	4/11/2018
Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	4

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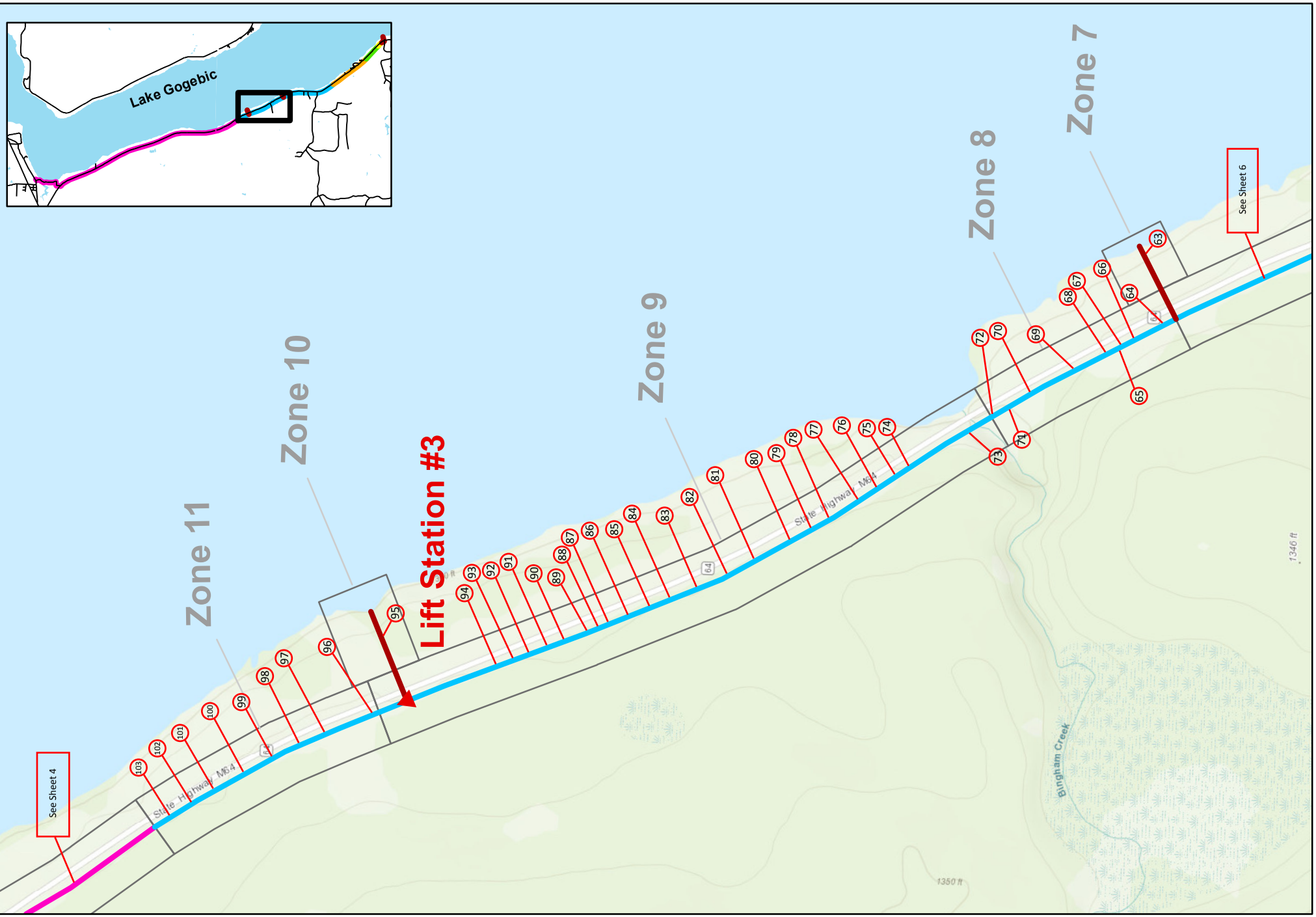

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

User Location

6" Force Main

5" Force Main

4" Force Main

3" Force Main

2" Force Main

1.5" Force Main

0 250 500

Feet

1 inch = 750 feet

Project:	15440
Drawn:	MCH
Date:	4/11/2018
Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	5

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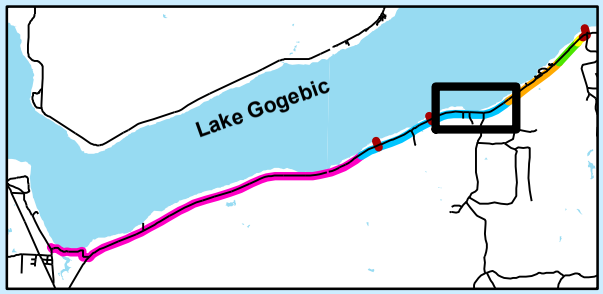

Zone 7

Zone 6

Zone 5

See Sheet 5

See Sheet 7

State Highway M64

Gillis Creek

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

User Location

6" Force Main

5" Force Main

4" Force Main

3" Force Main

2" Force Main

1.5" Force Main

0 250 500

Feet

1 inch = 750 feet

Project:	15440
Drawn:	MCH
Date:	4/11/2018
Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	6

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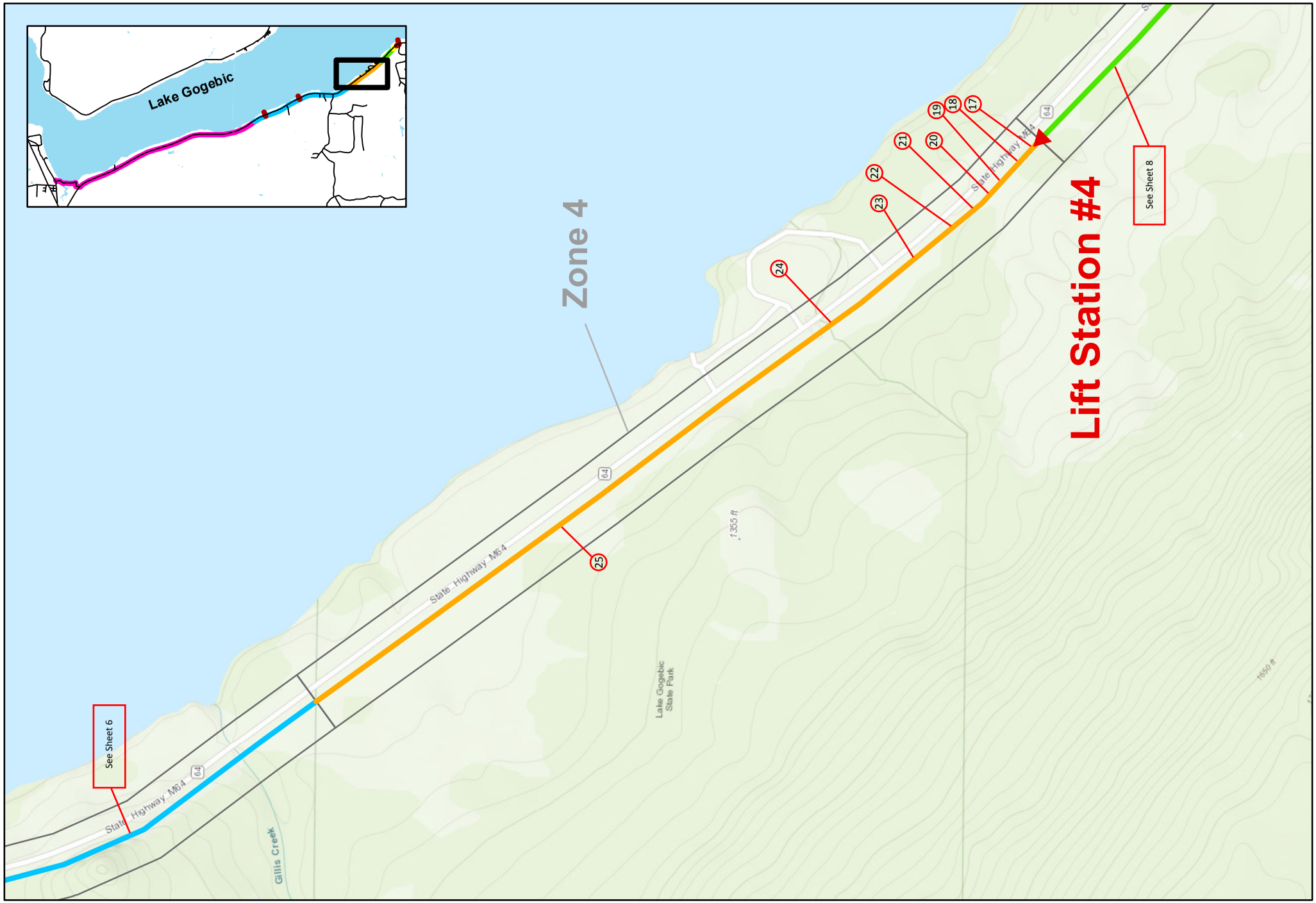

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

User Location

6" Force Main

5" Force Main

4" Force Main

3" Force Main

2" Force Main

1.5" Force Main

0 250 500

Feet

1 inch = 750 feet

Project:	15440
Drawn:	MCH
Date:	4/11/2018
Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	7

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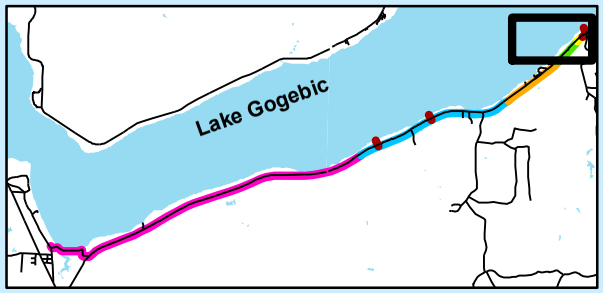

Zone 1

Zone 2

Zone 3

Lift Station #4

Alligator Point

State Highway M64

See Sheet 7

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

User Location

6" Force Main

5" Force Main

4" Force Main

3" Force Main

2" Force Main

1.5" Force Main

0 250 500

Feet

1 inch = 750 feet

Project:	15440
Drawn:	MCH
Date:	4/11/2018
Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	8

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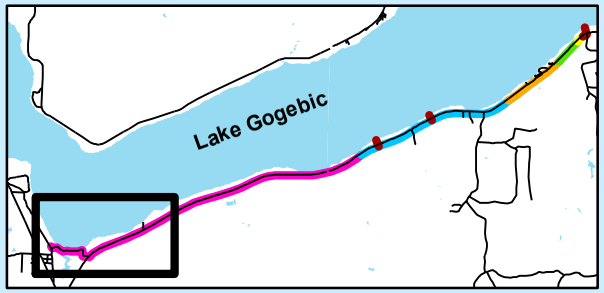
APPENDIX C: Low Pressure Sewer Schematic Layout



Lift Station #2

Zone 15

See Sheet 2

1354 ft

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

1.25" Service Line (with Pump Number)

6" Force Main

5" Force Main

4" Force Main

3" Force Main

2" Force Main

1.5" Force Main

0 500 1,000

Feet

1 inch = 1,250 feet

Project:	15440
Drawn:	MCH
Date:	4/11/2018
Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	1

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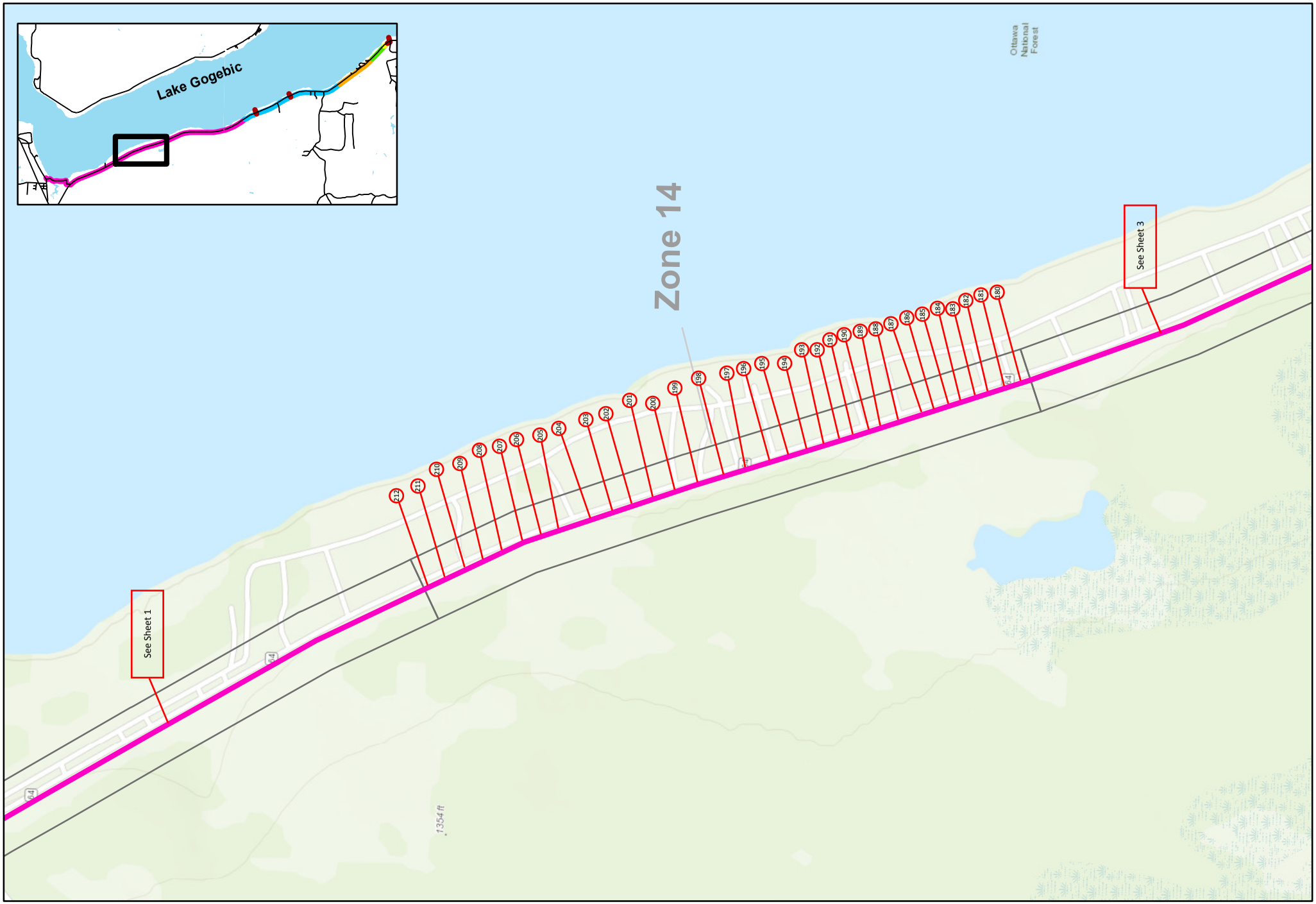

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

1 1.25" Service Line (with Pump Number)

6" Force Main

5" Force Main

4" Force Main

3" Force Main

2" Force Main

1.5" Force Main

0 250 500

Feet

1 inch = 750 feet

Project:	15440
Drawn:	MCH
Date:	4/11/2018
Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	2

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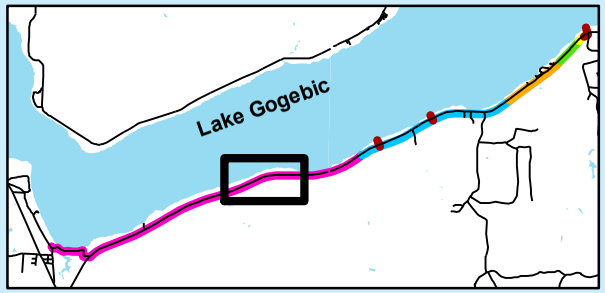
Ironwood, Michigan 49938
(906)932-5048
www.coleman-engineering.com



Zone 13

Ottawa National Forest

See Sheet 2

See Sheet 4

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

1.25" Service Line (with Pump Number)

6" Force Main

5" Force Main

4" Force Main

3" Force Main

2" Force Main

1.5" Force Main

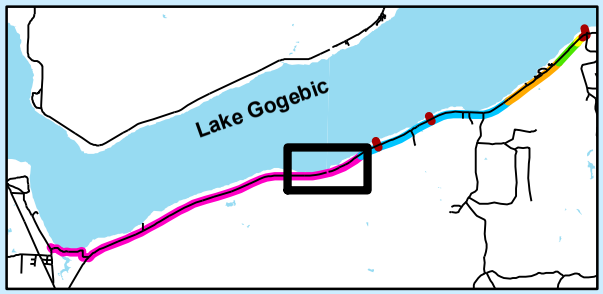
0 250 500

Feet

1 inch = 750 feet

Project:	15440
Drawn:	MCH
Date:	4/11/2018
Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	3

COLEMAN ENGINEERING COMPANY
635 Circle Drive
Iron Mountain, Michigan 49801
(906)774-3440
200 East Ayer Street
Ironwood, Michigan 49938
(906)932-5048
www.coleman-engineering.com



Zone 12

Zone 12

ONTONAGON

GOGEBIC

State Highway M64

State Highway M64

Hendrick Creek

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

1.25" Service Line (with Pump Number)

6" Force Main

5" Force Main

4" Force Main

3" Force Main

2" Force Main

1.5" Force Main

0 250 500

Feet

1 inch = 750 feet

Project:	15440
Drawn:	MCH
Date:	4/11/2018
Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	4

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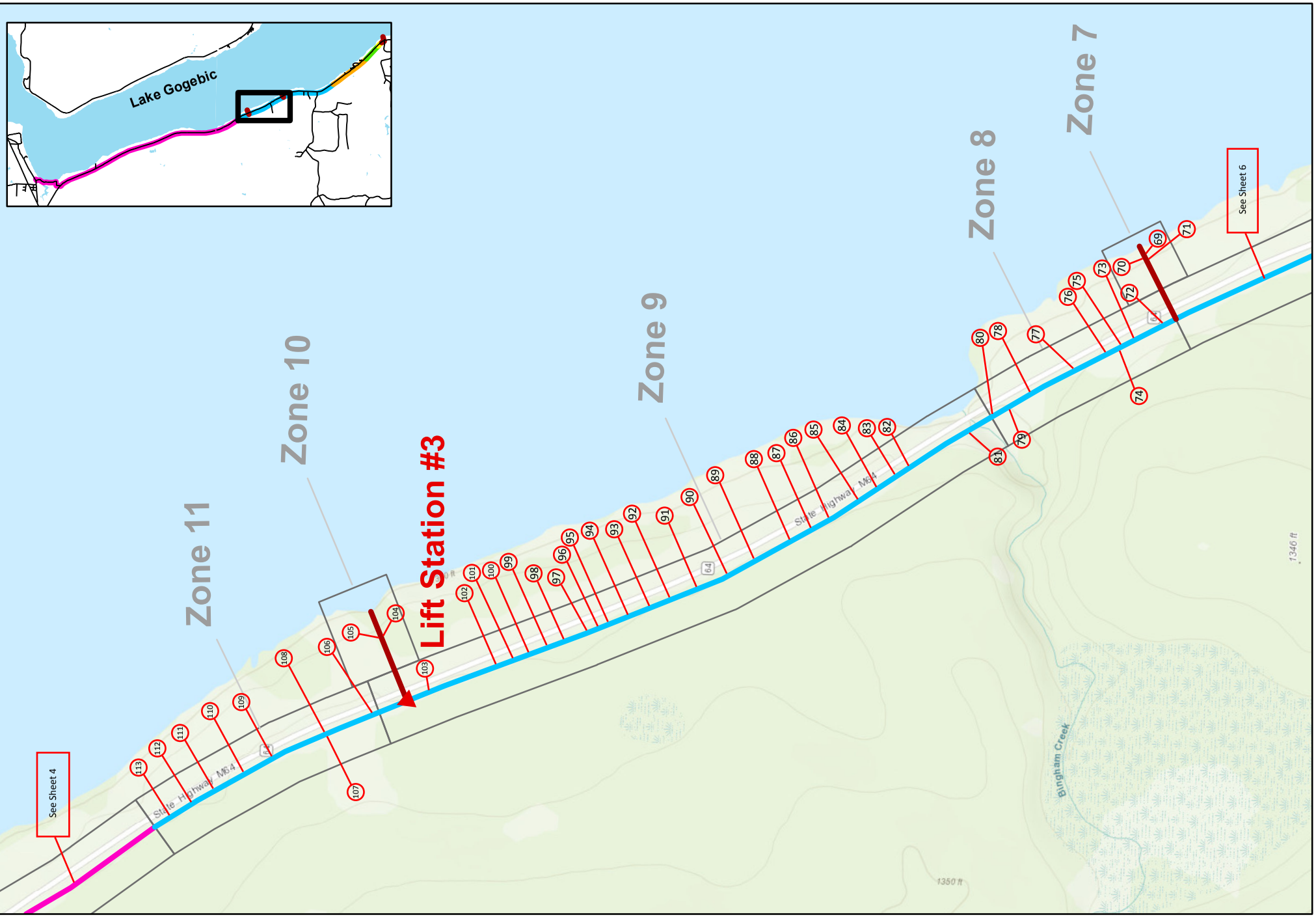

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

1.25" Service Line (with Pump Number)

6" Force Main

5" Force Main

4" Force Main

3" Force Main

2" Force Main

1.5" Force Main

0 250 500

Feet

1 inch = 750 feet

Project:	15440
Drawn:	MCH
Date:	4/11/2018
Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	5

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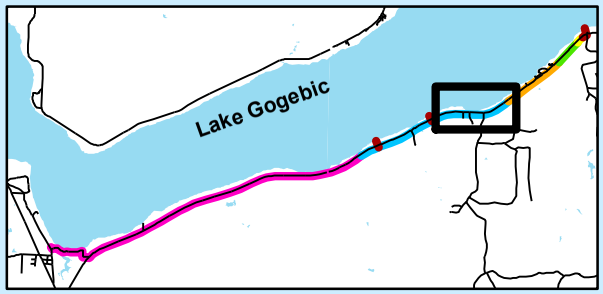

Zone 7

Zone 6

Zone 5

See Sheet 5

See Sheet 7

State Highway M64

Gillis Creek

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

1.25" Service Line (with Pump Number)

6" Force Main

5" Force Main

4" Force Main

3" Force Main

2" Force Main

1.5" Force Main

0 250 500

Feet

1 inch = 750 feet

Project:	15440
Drawn:	MCH
Date:	4/11/2018
Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	6

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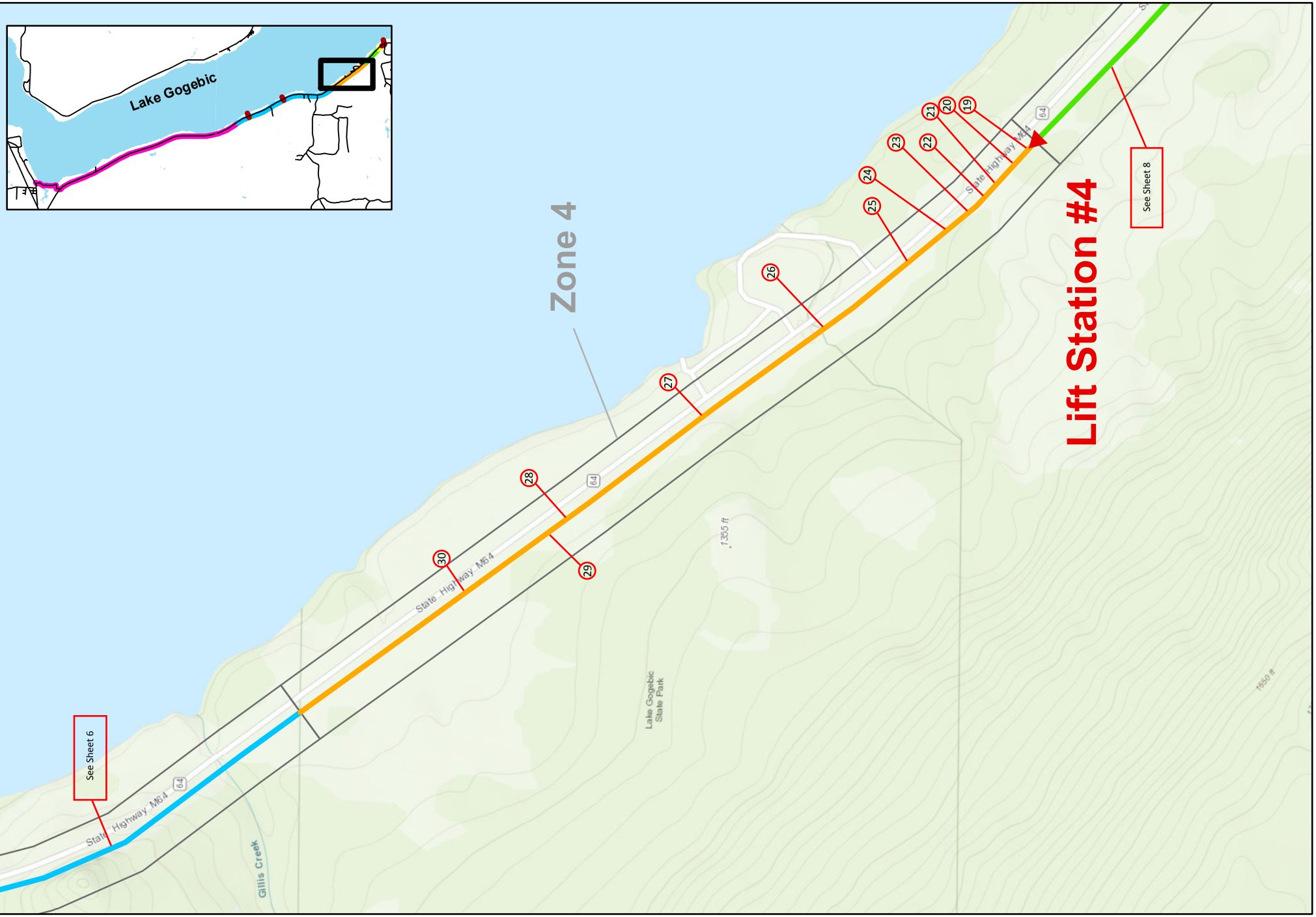

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

1 1.25" Service Line (with Pump Number)

6" Force Main

5" Force Main

4" Force Main

3" Force Main

2" Force Main

1.5" Force Main

0 250 500

Feet

1 inch = 750 feet

Project:	15440
Drawn:	MCH
Date:	4/11/2018
Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	7

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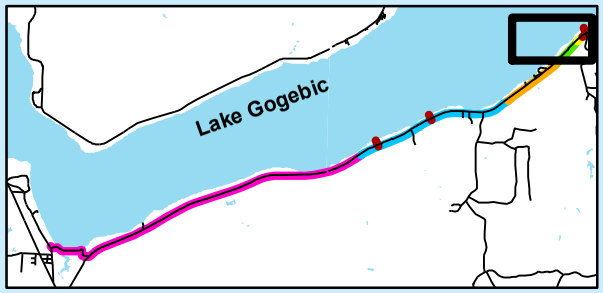

Zone 1

Zone 2

Zone 3

Lift Station #4

Alligator Point

State Highway M64

See Sheet 7

LAKE GOGEBIC AREA SEWER AUTHORITY

Phase I Sewer Project

Gogebic County & Ontonagon County, Michigan

Existing Lift Station

Proposed Lift Station

1.25" Service Line (with Pump Number)

6" Force Main

5" Force Main

4" Force Main

3" Force Main

2" Force Main

1.5" Force Main

0 250 500

Feet

1 inch = 750 feet

Project:	15440
Drawn:	MCH
Date:	4/11/2018
Map:	Bergland_SAW South.mxd
System:	MSP N Int'l Ft
Figure:	8

COLEMAN ENGINEERING COMPANY
635 Circle Drive
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APPENDIX D: Wastewater System Modeling Calculations – E-One Design Assistant

Environment One Corporation

Pressure Sewer Preliminary

Cost and Design Analysis

For

Lake Gogebic Area Sewer Authority
Phase 1 Sanitary Sewer Project

Prepared For:
Coleman Engineering Company
200 E Ayer Street
Ironwood MI 49938 United States
Tel: 906-932-5048
Fax: 906-932-3213
Prepared By: Brady Halvorson, EIT
April 3, 2018

April 3, 2018

Budgetary Low Pressure Sewer System Costs

Lake Gogebic Area Sewer Authority
Phase 1 Sanitary Sewer Project

	Quantity	Description	Unit Cost	Installation	Sub Total
Piping	1,700	1.50" Pipe	$0.00	0.00	$0.00
	700	2.00" Pipe	$0.00	0.00	$0.00
	2,400	3.00" Pipe	$0.00	0.00	$0.00
	5,450	4.00" Pipe	$0.00	0.00	$0.00
	14,110	5.00" Pipe	$0.00	0.00	$0.00
	29,660	6.00" Pipe	$0.00	0.00	$0.00
					$0.00

Number of Connections	**232**		
Total Per Connection	**$0.00**	**Total (w/o other)** >>>>>>>>>>>>>	**$0.00**
Grand Total Per Connection	**$0.00**	**Grand Total (including other)** >>>>>>>>>>>>>	**$0.00**

Note: The System Costs above are based on piping sized for, and Grinder Pumps manufactured by Environment One Corporation.

PRELIMINARY PRESSURE SEWER - PIPE SIZING AND BRANCH ANALYSIS

Prepared By:
Brady Halvorson, EIT

Lake Gogebic Area Sewer Authority
Phase 1 Sanitary Sewer Project

April 3, 2018

Zone Number	Connects to Zone	Number of Pumps in Zone	Accum Pumps in Zone	Gals/day per Pump	Max Flow Per Pump (gpm)	Max Sim Ops	Max Flow (GPM)	Pipe Size (inches)	Max Velocity (FPS)	Length of Main this Zone	Friction Loss Factor (ft/100 ft)	Friction Loss This Zone	Accum Fric Loss (feet)	Max Main Elevation	Minimum Pump Elevation	Static Head (feet)	Total Dynamic Head (ft)
This spreadsheet was calculated using pipe diameters for: SDR11HDPE											Friction loss calculations were based on a Constant for inside roughness "C" of:					120	
1.00	2.00	3	3	200	11.00	2	22.00	1.50	3.72	800.00	5.33	42.64	93.94	1,344.00	1,300.00	44.00	137.94
2.00	3.00	6	9	200	11.00	3	33.00	2.00	3.57	700.00	3.81	26.66	51.30	1,344.00	1,300.00	44.00	95.30
3.00	17.00	9	18	200	11.00	4	44.00	3.00	2.19	2,300.00	0.98	22.60	24.64	1,344.00	1,300.00	44.00	68.64
4.00	5.00	12	12	200	11.00	4	94.00	4.00	2.83	5,450.00	1.18	64.33	154.11	1,344.00	1,300.00	44.00	198.11
On	LS17	4.00		GPD:	3,600.000		GPM:	50.00	Type:	C	Desc:						
5.00	6.00	20	32	200	11.00	6	116.00	5.00	2.29	4,800.00	0.62	29.83	89.78	1,344.00	1,300.00	44.00	133.78
6.00	8.00	18	50	200	11.00	6	116.00	5.00	2.29	2,400.00	0.62	14.91	59.95	1,324.00	1,300.00	24.00	83.95
7.00	8.00	3	3	200	11.00	2	22.00	1.50	3.72	750.00	5.33	39.97	85.01	1,324.00	1,300.00	24.00	109.01
8.00	9.00	9	62	200	11.00	7	127.00	5.00	2.50	1,450.00	0.73	10.66	45.04	1,324.00	1,300.00	24.00	69.04
9.00	16.00	23	85	200	11.00	8	138.00	5.00	2.72	3,900.00	0.86	33.43	34.38	1,324.00	1,300.00	24.00	58.38
10.00	16.00	2	2	200	11.00	2	22.00	1.50	3.72	150.00	5.33	7.99	8.94	1,324.00	1,310.00	14.00	22.94
11.00	12.00	8	8	200	11.00	3	133.00	5.00	2.62	1,460.00	0.80	11.69	200.33	1,324.00	1,300.00	24.00	224.33
On	LS16	11.00		GPD:	21,000.000		GPM:	100.00	Type:	C	Desc:						
12.00	13.00	33	41	200	11.00	6	166.00	6.00	2.31	8,200.00	0.52	42.25	188.64	1,324.00	1,300.00	24.00	212.64
13.00	14.00	33	74	200	11.00	7	177.00	6.00	2.46	4,050.00	0.58	23.50	146.39	1,324.00	1,300.00	24.00	170.39
14.00	15.00	33	107	200	11.00	8	188.00	6.00	2.61	3,640.00	0.65	23.62	122.89	1,324.00	1,300.00	24.00	146.89
15.00	15.00	18	125	200	11.00	9	199.00	6.00	2.77	13,770.00	0.72	99.27	99.27	1,322.00	1,300.00	22.00	121.27
16.00	16.00	1	88	200	100.00	8	146.09	5.00	2.88	100.00	0.95	0.95	0.95	1,324.00	1,314.00	10.00	10.95
17.00	17.00	1	19	200	50.00	5	65.26	3.00	3.25	100.00	2.04	2.04	2.04	1,344.00	1,334.00	10.00	12.04

Note: This analysis is valid only with the use of progressive cavity type grinder pumps as manufactured by Environment One.

PRELIMINARY PRESSURE SEWER - ACCUMULATED RETENTION TIME (HR)

Prepared By:
Brady Halvorson, EIT

Lake Gogebic Area Sewer Authority
Phase 1 Sanitary Sewer Project

April 3, 2018

Zone Number	Connects to Zone	Accumulated Total of Pumps this Zone	Pipe Size (inches)	Gallons per 100 lineal feet	Length of Zone	Capacity of Zone	Average Daily Flow	Average Fluid Changes per Day	Average Retention Time (Hr)	Accumulated Retention Time (Hr)
This spreadsheet was calculated using pipe diameters for: SDR11HDPE								Gals per Day per Dwelling		200
1.00	2.00	3	1.50	9.85	800.00	78.82	600	7.61	3.15	9.93
2.00	3.00	9	2.00	15.40	700.00	107.82	1,800	16.69	1.44	6.78
3.00	17.00	18	3.00	33.47	2,300.00	769.73	3,600	4.68	5.13	5.34
4.00	5.00	12	4.00	55.31	5,450.00	3,014.57	6,000	1.99	12.06	31.15
5.00	6.00	32	5.00	84.50	4,800.00	4,056.12	10,000	2.47	9.73	19.09
6.00	8.00	50	5.00	84.50	2,400.00	2,028.06	13,600	6.71	3.58	9.35
7.00	8.00	3	1.50	9.85	750.00	73.90	600	8.12	2.96	8.73
8.00	9.00	62	5.00	84.50	1,450.00	1,225.29	16,000	13.06	1.84	5.77
9.00	16.00	85	5.00	84.50	3,900.00	3,295.60	20,600	6.25	3.84	3.94
10.00	16.00	2	1.50	9.85	150.00	14.78	400	27.06	0.89	0.98
11.00	12.00	8	5.00	84.50	1,460.00	1,233.74	22,600	18.32	1.31	23.73
12.00	13.00	41	6.00	119.90	8,200.00	9,831.71	29,200	2.97	8.08	22.42
13.00	14.00	74	6.00	119.90	4,050.00	4,855.91	35,800	7.37	3.26	14.34
14.00	15.00	107	6.00	119.90	3,640.00	4,364.32	42,400	9.72	2.47	11.08
15.00	15.00	125	6.00	119.90	13,770.00	16,510.08	46,000	2.79	8.61	8.61
16.00	16.00	88	5.00	84.50	100.00	84.50	21,200	250.88	0.10	0.10
17.00	17.00	19	3.00	33.47	100.00	33.47	3,800	113.55	0.21	0.21

Note: This analysis is valid only with the use of progressive cavity type grinder pumps as manufactured by Environment One

Lake Gogebic Area Sewer Authority
Phase 1 Sanitary Sewer Project

Prepared by : Brady Halvorson, EIT **On:** April 3, 2018

Notes :

<<<<< E N D O F N O T E S >>>>>

APPENDIX E: Project Cost Estimates

Lake Gogebic Area Sewer Authority
Preliminary Cost Estimate for LGASA Phase I Project
10/19/2018 -- Low Pressure Sewer Alternative

Item Number	Description	Unit	Quantity	Unit Price	Extension
1	1.5-inch HDPE Force Main	Lineal Foot	1700	$ 17.00	$ 28,900.00
2	2-inch HDPE Force Main	Lineal Foot	700	$ 18.00	$ 12,600.00
3	3-inch HDPE Force Main	Lineal Foot	2300	$ 23.00	$ 52,900.00
4	4-inch HDPE Force Main	Lineal Foot	5450	$ 23.50	$ 128,075.00
5	5-inch HDPE Force Main	Lineal Foot	14010	$ 25.15	$ 352,351.50
6	6-inch HDPE Force Main	Lineal Foot	29660	$ 25.15	$ 745,949.00
7	1.5-inch Gate Valve and Box	Each	3	$ 455.00	$ 1,365.00
8	2-inch Gate Valve and Box	Each	1	$ 530.00	$ 530.00
9	3-inch Gate Valve and Box	Each	2	$ 1,300.00	$ 2,600.00
10	4-inch Gate Valve and Box	Each	3	$ 1,430.00	$ 4,290.00
11	5-inch Gate Valve and Box	Each	6	$ 1,750.00	$ 10,500.00
12	6-inch Gate Valve and Box	Each	10	$ 1,750.00	$ 17,500.00
13	Grinder Pump Station	Each	230	$ 4,515.00	$ 1,038,450.00
14	Electrical Connection	Lineal Foot	10000	$ 7.50	$ 75,000.00
15	Air Relief and Flushing Station	Each	32	$ 4,640.00	$ 148,480.00
16	Flushing Station	Each	40	$ 3,125.00	$ 125,000.00
17	1.25-inch HDPE Service Force Main	Lineal Foot	78850	$ 35.00	$ 2,759,750.00
18	1.25-inch HDPE Service Force Main - 80 Feet-Bored Under M-64	Each	11	$ 4,400.00	$ 48,400.00
19	Connect to Existing Lift Station	Each	1	$ 7,000.00	$ 7,000.00
20	Jack & Bore Railroad Crossing - Hoop & Holler Road	Lump Sum	1	$ 10,450.00	$ 10,450.00
21	Rock Excavation	Cubic Yd	1500	$ 125.00	$ 187,500.00
22	Special Backfill	Cubic Yd	1500	$ 9.00	$ 13,500.00
23	Stone Refill (MDOT 6A)	Cubic Yd	500	$ 28.00	$ 14,000.00
24	Erosion Control	Lump Sum	1	$ 48,000.00	$ 48,000.00
25	Utility Exploration	Each	25	$ 400.00	$ 10,000.00
26	Service Line Connection (Fused Saddle Tap)	Each	230	$ 1,100.00	$ 253,000.00
27	Tee Connection (Less than 3-inch)	Each	3	$ 850.00	$ 2,550.00
28	Spare "Pump Core" Units	Each	5	$ 1,400.00	$ 7,000.00
29	Asphalt Pavement (330#/syd 13A)	Sq. Yard	250	$ 20.00	$ 5,000.00
30	8 inches of MDOT 23A Gravel	Sq. Yard	15000	$ 7.00	$ 105,000.00
31	8 inches of MDOT 22A Gravel	Sq. Yard	250	$ 7.00	$ 1,750.00
32	Clearing	Acre	8.0	$ 6,500.00	$ 52,000.00
33	Earth Excavation / placement	Cubic Yd	20600	$ 7.00	$ 144,200.00
34	Liner	Sq. Yard	18000	$ 4.00	$ 72,000.00
35	Sand Cover	Cubic Yd	6000	$ 11.00	$ 66,000.00
36	Lift Station	Each	2	$ 226,800.00	$ 453,600.00
37	Lagoon Cell	Lump Sum	1	$ 516,000.00	$ 516,000.00
38	Land for Lagoon Cell	Acre	5.5	$ 1,000.00	$ 5,500.00
39	Monitoring Wells	Each	3	$ 5,500.00	$ 16,500.00
40	Topsoil	Cubic Yd	1725	$ 20.00	$ 34,500.00
41	Restoration	Lump Sum	1	$ 90,000.00	$ 90,000.00
42	Roadway Gravel	Cubic Yd	200	$ 20.00	$ 4,000.00
43	Fencing	Lineal Foot	2000	$ 20.00	$ 40,000.00
	Estimated Direct Construction				$ 7,711,690.50
	Contingencies (10%)				$ 771,169.05
	Engineering (18%)				$ 1,388,104.29
	Admin / Legal (lots of Easements)				$ 140,000.00
	Estimated Construction Total				$ 10,010,963.84
	Capitalized Interest				$ 990,180.00
	PROJECT TOTAL (rounded to nearest dollar)				**$ 11,001,144.00**

Lake Gogebic Area Sewer Authority
Preliminary Cost Estimate for LGASA Phase I Project
10/19/2018 -- Gravity Sewer Alternative

Item Number	Description	Unit	Quantity	Unit Price	Extension
1	1.5-inch HDPE Force Main	Lineal Foot	1700	$ 17.00	$ 28,900.00
2	Gravity Main SDR 26	Lineal Foot	53000	$ 45.00	$ 2,385,000.00
3	Manhole 4-FT Diameter (includes Casting)	Each	144	$ 5,000.00	$ 720,000.00
4	1.5-inch Gate Valve and Box	Each	3	$ 455.00	$ 1,365.00
5	Grinder Pump Station	Each	230	$ 4,515.00	$ 1,038,450.00
6	Electrical Connection	Lineal Foot	10000	$ 7.50	$ 75,000.00
7	Air Relief and Flushing Station	Each	2	$ 4,640.00	$ 9,280.00
8	Flushing Station	Each	2	$ 3,125.00	$ 6,250.00
9	1.25-inch HDPE Service Force Main	Lineal Foot	78850	$ 35.00	$ 2,759,750.00
10	1.25-inch HDPE Service Force Main - 80 Feet-Bored Under M-64	Each	11	$ 4,400.00	$ 48,400.00
11	Connect to Existing Lift Station	Each	1	$ 7,000.00	$ 7,000.00
12	Jack & Bore Railroad Crossing - Hoop & Holler Road	Lump Sum	1	$ 10,450.00	$ 10,450.00
13	Rock Excavation	Cubic Yd	1500	$ 125.00	$ 187,500.00
14	Special Backfill	Cubic Yd	1500	$ 9.00	$ 13,500.00
15	Stone Refill (MDOT 6A)	Cubic Yd	500	$ 28.00	$ 14,000.00
16	Erosion Control	Lump Sum	1	$ 48,000.00	$ 48,000.00
17	Utility Exploration	Each	25	$ 400.00	$ 10,000.00
18	Service Line Connection (Fused Saddle Tap)	Each	230	$ 1,100.00	$ 253,000.00
19	Tee Connection (Less than 3-inch)	Each	3	$ 850.00	$ 2,550.00
20	Spare "Pump Core" Units	Each	5	$ 1,400.00	$ 7,000.00
21	Asphalt Pavement (330#/syd 13A)	Sq. Yard	250	$ 20.00	$ 5,000.00
22	8 inches of MDOT 23A Gravel	Sq. Yard	15000	$ 7.00	$ 105,000.00
23	8 inches of MDOT 22A Gravel	Sq. Yard	250	$ 7.00	$ 1,750.00
24	Clearing	Acre	8.0	$ 6,500.00	$ 52,000.00
25	Earth Excavation / placement	Cubic Yd	20600	$ 7.00	$ 144,200.00
26	Liner	Sq. Yard	18000	$ 4.00	$ 72,000.00
27	Sand Cover	Cubic Yd	6000	$ 11.00	$ 66,000.00
28	Lift Station	Each	12	$ 226,800.00	$ 2,721,600.00
29	Lagoon Cell	Lump Sum	1	$ 516,000.00	$ 516,000.00
30	Land for Lagoon Cell	Acre	5.5	$ 1,000.00	$ 5,500.00
31	Monitoring Wells	Each	3	$ 5,500.00	$ 16,500.00
32	Topsoil	Cubic Yd	1725	$ 20.00	$ 34,500.00
33	Restoration	Lump Sum	1	$ 90,000.00	$ 90,000.00
34	Roadway Gravel	Cubic Yd	200	$ 20.00	$ 4,000.00
35	Fencing	Lineal Foot	2000	$ 20.00	$ 40,000.00
	Estimated Direct Construction				$ 11,499,445.00
	Contingencies (10%)				$ 1,149,944.50
	Engineering (18%)				$ 2,069,900.10
	Admin / Legal (lots of Easements)				$ 140,000.00
	Estimated Construction Total				$ 14,859,289.60
	Capitalized Interest				$ 1,469,610.00
	PROJECT TOTAL (rounded to nearest dollar)				**$ 16,328,900.00**

APPENDIX F: U.S. Department of Agriculture – Rural Development, Michigan Guide 2, Attachment 1 – Customer User Information

CUSTOMER USER INFORMATION

1.) Rural Development uses some of the information from the PER, especially Sections 6(e) and (f), for underwriting purposes. Note that for income projection purposes, every effort should be made to identify actual data regarding water usage or wastewater generation. For metered systems, actual data should be used.

When financing construction of a new system or improvements to an existing system without any existing usage data, water use and wastewater generation approximation for income projection purposes should, if at all possible, be based on information from surrounding similar communities and systems. The source of data used should be documented in the PER.

The value of 100 GPCD shown in Section 6 is a general value and may not be appropriate for many rural systems finance with WWD funds. In the absence of reliable data, a value of **5,000 gallons per EDU per month** (approximately 67 GPCD or 167 GPD per EDU) should be used.

	Number of Existing Customers	Total Monthly Service Usage (in gallons)	Number of Users after Improvements	Projected Total Monthly Service Usage (in gallons)	EDU's (Agency Use)
Residential Dwellings:			**212**	**650,000**	
Commercial Users:			**6**	**402,400**	
Total:			**218**	**1,052,400**	

Breakdown of Commercial Users	Number Existing Users	Number of User after project completion	Billed/Metered Monthly Total Service Usage
Large Commercial		0	N/A
Small Commercial		3	110,500
Industrial		0	N/A
Government		3	291,900
Churches		0	N/A
Apartment Buildings		0	N/A
Duplexes		0	N/A
Schools		0	N/A
Mobile Home Park		0	N/A

2.) Indicate (X) the applicant's proposed bonding (financing) method:

X	Revenue Bond (Act 94)		County Contract Bond		General Obligation Bond
	Special Assessment Bond		Water/Sewer Authority Bond		Other:

3.) The PER must have a copy of the existing rate schedule, if applicable. Applicant's proposed operating budget, rates and charges must be in Preliminary Engineering Report as per Bulletin 1780-2, Preliminary Engineering Reports for Water and Waste Disposal Program, Section 2)d) and 6)f)i-iv.

4.) Project Contacts:

Applicant Contact:	Kelly Dunbar, LGASA Chairman		
Address:	P.O. Box 43; Marenisco, MI 49947		
Email Address:	dunbarK1@michigan.gov	Phone:	906-392-0011
Engineer Contact:	Paul Anderson, P.E.; Project Manager, Coleman Engineering Company		
Address:	200 E. Ayer Street, Ironwood, MI, 49938		
Email Address:	panderson@coleman-engineering.com	Phone:	906-932-5048
Bond Counsel Contact:	Steve Mann, Miller Canfield Paddock & Stone, PLC		
Address:	150 West Jefferson Ave., Suite 2500, Detroit, MI 48226		
Email Address:	mann@millercanfield.com	Phone:	313-496-7509
Legal Counsel Contact:	James Bucknell		
Address:	P.O. Box 101; Bessemer, MI 49911		
Email Address:	jamesmbucknell@outlook.com	Phone:	906-932-0401
Financial Consultant Contact:	N/A		
Address:			
Email Address:		Phone:	

5.) Applicant's Population Information by Race and Ethnicity for the proposed service area, if known:

	Asian	Black/African American	American Indian or Alaskan Native	Native Hawaiian or Pacific Islander	White	Multiple Races Selected	Other Race	Total Population
RACE	2	0	19	0	691	8	1	721

	Hispanic or Latino	Not Hispanic or Latino	Total Population
ETHNICITY	6	715	721

6.) Land Rights

	# of acres	# of acres to be leased	Purchase price of land	Market value of land
Land to be acquired:	0	0	0	0
Land now owned:	0	0	0	0

7.) Other system information

Public Water System (PWS) ID #_____.
If water is being purchased – cost per 1,000 gallons or per 100 cu. ft. $_____.

NPDES Permit # MIG580330 .
If wastewater treatment is by contract – cost per 1,000 gallons or per 100 cu ft. $_____.

APPENDIX G: Bergland Township NPDES Permit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER RESOURCES DIVISION
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
Authorized by Michigan Act 451, Public Acts of 1994, as amended, Part 31

CERTIFICATE OF COVERAGE (COC)

Under General Permit No. MIG589000
Wastewater Stabilization Lagoon General Permit

COC NO.:	MIG580330
DESIGNATED NAME:	Bergland Twp WWSL
PERMITTEE:	Bergland Township
MAILING ADDRESS:	101 Pine Street PO Box 326 Bergland, Michigan 49910

This COC authorizes the permittee to discharge treated sanitary wastewater from the Bergland Township Wastewater Sewage Lagoon located at Highway M-28, Bergland, Michigan 49910. Consistent with the criteria and requirements established in General Permit No. MIG589000, the permittee is authorized to discharge 28 MGY of treated sanitary wastewater from Monitoring Point 001A through Outfall 001. Outfall 001 discharges to the Ontonagon River, in the NE1/4, SW1/4, Section 3, Town 48 N, Range 42 W, Ontonagon County.

All sections of the general permit are applicable to this facility except for Part I.A.4. - Additional Final Effluent Limitation for Total Phosphorus.

References in the general permit to the Department shall be defined as the Upper Peninsula District Supervisor of the Water Resources Division. The Upper Peninsula District Office is located at the K. I. Sawyer International Airport and Business Center, 420 Fifth Street, Gwinn, Michigan 49841, telephone: 906-346-8300, fax: 906-346-4480.

Any person who is aggrieved by this COC may file a sworn petition for a contested case hearing on this COC with the State Office of Administrative Hearings and Rules of the Michigan Department of Licensing and Regulatory Affairs in accordance with the provisions of R323.2192(c) of the Michigan Administrative Code. The Department of Licensing and Regulatory Affairs may reject any petition filed more than 60 days after issuance as being untimely.

The issuance of this COC does not 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 Environmental Quality (Department) permits, or approvals from other units of government as may be required by law.

This COC is based on a complete application received by the Department on November 19, 2008. The permittee is subject to all conditions specified in General Permit No. MIG589000 issued August 27, 2008, expiring April 1, 2014. This COC may be modified, terminated, reissued, or revoked as allowed for in General Permit No. MIG589000.

This COC takes effect on the date of issuance.

Issued January 14, 2009. Based on an application amendment submitted on April 25, 2011 and amended on July 22, 2011, this certificate of coverage was modified on _____.

_____
Tiffany J. Myers, Chief
Lakes Michigan and Superior Permits Unit
Permits Section
Water Resources Division

EQP 4677 (10/97)

Note: Pursuant to the Executive Order 2011-1, all references to the “Water Bureau” in the general permit should now be interpreted as the "Water Resources Division".

PERMIT NO. MIG580000

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTEWATER DISCHARGE GENERAL PERMIT

WASTEWATER STABILIZATION LAGOON EFFLUENT

In compliance with the provisions of the Federal Water Pollution Control Act (33 U.S.C. 1251 *et seq*., as amended; the "Federal Act"); 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 2011-1, wastewater that is associated with stabilization lagoon effluent that is adequately regulated by this general National Pollutant Discharge Elimination System (NPDES) permit, (the "General Permit") is authorized to be discharged from facilities specified in individual "Certificates of Coverage" (COCs) in accordance with effluent limitations, monitoring requirements, and other conditions set forth in this General Permit.

The applicability of this permit shall be limited to seasonal (spring/fall) discharges of sanitary or municipal wastewater that 1) have been adequately treated by a wastewater stabilization lagoon; 2) are not subject to the industrial pretreatment program requirements under the NREPA and R 323.2301 through R 323.2317 of the Michigan Administrative Code (Part 23 Rules); and 3) have been determined by the Michigan Department of Environmental Quality (the "Department") not to need an individual permit. Aerobic lagoons, both mechanically aerated and non-mechanically aerated, which discharge treated sanitary wastewater, are included. The lagoon system shall 1) meet accepted design criteria as determined by the Department and 2) comply with secondary treatment standards for lagoon systems in Part I.A.1. of this General Permit and other requirements and limitations stated herein as specified in the COC. This permit does not authorize discharges determined by the Department to need individual NPDES permits or different general permits, or that may cause or contribute to a violation of the Water Quality Standards.

In order to constitute a valid authorization to discharge, this permit must be accompanied by a COC issued by the Department. The COC will specify which sections of the General Permit apply at the individual facility, including if the Groundwater Monitoring for Lagoon Exfiltration/Leakage, Additional Final Effluent Limitation for Total Phosphorus, and/or Residuals Management Program for Land Application of Biosolids for New or Approved Programs.

Unless specified otherwise, all contact with the Department required by this permit shall be to the position(s) indicated in the COC.

This General Permit shall take effect **April 1, 2014**. The provisions of this permit are severable. After notice and opportunity for a hearing, this General 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 General Permit shall supersede NPDES Permit No. MIG589000, expiring April 1, 2014.

This General Permit shall expire at midnight, **April 1, 2019**.

Issued January 29, 2014. Based on a request submitted on September 29, 2014, this permit was modified (minor) on October 2, 2014.

Original Permit Signed by Philip Argiroff
Philip Argiroff, Chief
Permits Section
Water Resources Division

PART I

Section A. Effluent Limitations And Monitoring Requirements

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 the occurrence of a discharge. The permittee shall submit the fee in response to the Department's annual notice. The fee shall be postmarked by January 15 for notices mailed by December 1. The fee is due no later than 45 days after receiving the notice for notices mailed after December 1.

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. In response to the Department's annual notice, the permittee shall submit the fee, which shall be postmarked no later than January 31 of each year.

CONTESTED CASE INFORMATION

The terms and conditions of this General Permit shall apply to an individual facility on the effective date of a COC for the facility. 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 Environmental Quality, 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. Effluent Limitations And Monitoring Requirements

1. Final Effluent Limitations

During the period beginning on the effective date of an individual COC under this General Permit, and lasting until the expiration of this permit or termination of the individual COC, the permittee is authorized to discharge treated sanitary wastewater to the surface waters of the state of Michigan. Effluent shall be discharged during high-flow conditions in the spring and/or fall of each year. There shall be no discharge from June 1 to September 30 and from January 1 to February 28/29 (see b. below). In addition, there shall be no discharge during periods of significant ice cover on the receiving stream unless authorized by the Department. Such discharge shall be limited and monitored by the permittee as specified below.

	Maximum Limits for Quantity or Loading				Maximum Limits for Quality or Concentration					
Parameter	**Monthly**	**7-Day**	**Daily**	**Units**	**Monthly**	**7-Day**	**Daily**	**Units**	**Monitoring Frequency**	**Sample Type**
Flow (see b. below)	(report)	---	(report)	MGD	---	---	---	---	Daily	Report Total Daily Flow
Biochemical Oxygen Demand (BOD_5)	---	---	---	---	30	45	---	mg/l	see d. below	Composite
Total Suspended Solids										
Mar-May (see b. below)	---	---	---	---	70	100	---	mg/l	see d. below	Composite
Oct-Dec	---	---	---	---	40	45	---	mg/l	see d. below	Composite
Ammonia Nitrogen (as N)	---	---	---	---	(report)	---	---	mg/l	see d. below	Composite
Total Phosphorous (as P)	---	---	---	---	(report)	---	---	mg/l	see d. below	Composite
					Geometric Mean					
					Monthly	**7-Day**				
Fecal Coliform Bacteria	---	---	---	---	200	400	---	cts/ 100 ml	see d. below	Grab
					Minimum Daily		**Maximum Daily**			
pH	---	---	---	---	6.5	---	10	S.U.	see d. below	Grab
Dissolved Oxygen	---	---	---	---	5.0	---	---	mg/l	Daily	Grab

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. Acceptable Discharge Periods
If the Department determines that discharge periods of shorter duration than March 1 through May 31 and/or October 1 through December 31 are necessary to protect water quality, the reduced discharge periods will be stated in the COC. Upon approval by the Upper Peninsula District Supervisor, the spring discharge period may be extended to April 1 through June 21 for facilities located in the following counties: Baraga, Dickinson, Gogebic, Houghton, Iron, Keweenaw, Marquette, and Ontonagon.

PART I

Section A. Effluent Limitations And Monitoring Requirements

c. Discharges Outside of Acceptable Discharge Periods

For discharges outside the acceptable discharge periods, the permittee shall notify the Department of the potential noncompliance prior to discharge, as required by Part 1.A.6. of this General Permit.

d. Discharge Management
The discharge is to be managed consistent with the following requirements:

1) Cell Isolation - The permittee shall isolate a cell from cells receiving untreated sanitary wastewater at least two weeks in advance of a proposed discharge. There shall be no discharge to the surface waters from unisolated cells.

2) Pre-Discharge Sampling - The permittee shall sample the isolated cell for BOD_5, Total Suspended Solids, Ammonia Nitrogen, Total Phosphorus, Fecal Coliform Bacteria, and pH no more than two weeks in advance of a proposed discharge. Samples shall be drawn from a point approximately five feet from the edge of the cell and one foot beneath the water surface. All samples shall be grab samples. If more than two weeks will pass prior to the beginning of an actual discharge, additional pre-discharge samples shall be obtained, analyzed, and reported to the Department prior to discharge.

3) Discharge Approval Required - The permittee shall notify and receive approval from the appropriate District Supervisor or staff authorized to act on his/her behalf prior to discharge of any effluent for each discharge event. The permittee shall supply the results of all pre-discharge effluent samples and the results of a Dissolved Oxygen sample taken no more than 24 hours prior to notification.

4) Discharge Duration - Multiple discharge events are authorized in the spring and/or fall of each year in accordance with Part I.A.1.b. of this General Permit and the following provision. Discharge event duration shall not exceed 10 days within a 14-day period. The discharge may be continuous or intermittent during the event. After the discharge event is ended, the permittee shall wait a minimum of seven calendar days prior to initiating a new discharge event.

5) Discharge Sampling Frequency - Flow and Dissolved Oxygen shall be measured daily during discharge. All other parameters shall be measured the first day and every other day during discharge, including the last day of discharge. The Department may approve alternate sampling frequencies that are demonstrated to be representative of the discharge.

6) Discharge Sample Type and Location - The sampling for BOD_5, Total Suspended Solids, Total Phosphorus, and Ammonia Nitrogen shall be 3-portion composite samples or 24-hour composite samples of the effluent. The sampling for Dissolved Oxygen, Fecal Coliform Bacteria, and pH shall be grab samples of the effluent.

e. Discharge Monitoring Reports
Monthly Discharge Monitoring Reports (DMRs) shall be submitted for the months of October, November, December, March, April, and May whether or not there has been a discharge. Upper Peninsula facilities authorized under Part 1.A.1.b. of this General Permit shall also submit a monthly DMR for any approved discharge event. Daily DMRs shall be submitted only during months a discharge occurred.

f. Security Fencing
The lagoon shall be enclosed by security fencing. The fencing shall include gates wide enough to accommodate mowing machinery. All gates shall be locked to prevent unauthorized access. Metal warning signs shall be posted on the fencing. Lagoon systems that utilize sophisticated mechanical equipment should consider more secure fencing and access control.

g. Water Treatment Additives
This General Permit does not authorize the discharge of water additives without approval from the Department. Approval of water additives is authorized under separate correspondence. Water additives include any material that is added to water used at the facility or to a wastewater generated by the

facility to condition or treat the water. In the event a permittee proposes to discharge water additives, including an increased discharge concentration of a previously approved water additive, the permittee shall submit a request to the Department for approval. See Part I.A.5. of this General Permit, for information on requesting water treatment additive use.

h. Construction Approval
This General Permit does not authorize the construction or modification of any physical structures of the wastewater treatment facility. The permittee shall receive any required approval of plans and specifications from the appropriate Department before commencing construction of the wastewater treatment facility necessary for compliance with this General Permit.

2. Facility Operation and Maintenance

The permittee shall comply with the inspection, operation, and maintenance program requirements specified below. An alternate facility operations program may be approved by the Department.

a. Lagoon Inspection
The permittee shall inspect the lagoon facilities three times weekly year-round unless otherwise authorized by the Department. These inspections shall include:

1) the lagoon dikes for vegetative growth, erosion, slumping, animal burrowing or breakthrough, and condition of the lagoon liner;

2) the lagoon for growth of aquatic plants, offensive odors, insect infestations, scum, floating sludge, and septic conditions;

3) the depth of the water in each cell and the freeboard;

4) the drain pipe to ensure there is no discharge;

5) the control structures and pump stations to assure that valves, gates, and alarms are set correctly and properly functioning;

6) the lagoon security fence and warning signs; and

7) analysis for Dissolved Oxygen in each lagoon cell at least once weekly, except when the lagoons are ice covered. The data shall be kept as retained self-monitoring. See Part II.C.3. of this General Permit.

The permittee shall initiate steps to correct any condition that is not in accordance with the facility maintenance program outlined in Part I.A.2.b. of this General Permit. A record of the inspections shall be maintained by the permittee for a period of three years.

PART I

Section A. Effluent Limitations And Monitoring Requirements

b. Facility Maintenance
The permittee shall implement a Facility Maintenance Program that incorporates the following management practices unless otherwise authorized by the Department.

1) Vegetation shall be maintained at a height not more than six inches above the ground on lagoon dikes and around the fencing.

2) At all times, the facility shall be maintained to prevent the negative effects of floating material and/or water perimeter emergent rooted aquatic plants on Dissolved Oxygen concentrations, treatment efficiency, nuisance organisms, offensive odors, or other measurable impacts. However, in no case, even without demonstrated impact, shall the floating material and/or water perimeter emergent rooted aquatic plants exceed 40 percent cover.

3) Dike damage due to erosion or animal burrowing shall be corrected immediately and steps taken to prevent occurrences in the future.

4) The integrity of the lagoon liner shall be protected. Liner damages shall be corrected immediately and steps taken to prevent future occurrences.

5) The occurrence of scum, floating sludge, offensive odors, insect infestations, and septic conditions shall be minimized.

6) A schedule for the inspection and maintenance of the collection system, lift stations, mechanical and electrical systems, transfer stations, and control structures shall be developed and implemented.

c. Lagoon Drawdown Conditions
The permittee shall observe the following conditions when drawing down a cell for transfer or discharge, unless otherwise authorized by the Department.

1) Water discharged shall be removed from the surface two feet of the cell at a rate of less than one foot per day.

2) The permittee shall maintain a minimum of two feet of freeboard in all cells at all times.

3) The permittee shall maintain a minimum of two feet of water in all cells at all times.

3. Groundwater Monitoring for Lagoon Exfiltration/Leakage

Based on the information submitted in the permit application, the permittee may be required to install groundwater monitoring wells and conduct groundwater monitoring. The intent of such monitoring, if required, will be to demonstrate that the lagoons have not impacted, and are not likely to impact surface waters, in accordance with the Part 4, Water Quality Standards (Part 4 Rules), promulgated under Part 31, Water Resources Protection, of the NREPA, or groundwater above the standard described in R 323.2222 of Part 22, Groundwater Quality Administrative Rules (Part 22 Rules), promulgated pursuant to Part 31. Information that may be considered by the Department in making this determination include, but is not limited to: the date when the lagoon was constructed; construction design methods and materials, including whether liner specifications meet R 323.2237 of the Part 22 Rules or providing equivalency as allowed in R 323.2237; and indications of whether there is a direct vent to surface waters and if such vent complies with surface water quality standards.

If the Department determines the permittee needs to conduct groundwater monitoring to verify and assure that leakage from the lagoons to the groundwaters and/or surface waters of the state is not causing unacceptable impacts, the following conditions shall apply:

a. The permittee shall install groundwater monitoring wells around the perimeter of the lagoons to document both groundwater water quality impacts and groundwater flow. A plan for the monitoring wells shall be submitted to the Department for approval within 90 days of notification by the Department.

Section A. Effluent Limitations And Monitoring Requirements

Within 90 days of approval of the plan, unless the Department approves an extended period (not to exceed 180 days), the groundwater monitoring wells shall be installed.

b. The permittee shall submit a groundwater monitoring plan to the Department for approval within 90 days of the effective date of this permit. This groundwater monitoring plan may be submitted as part of the monitoring well work plan. The monitoring plan shall include monitoring of the groundwater elevation and the following parameters: total phosphorus, dissolved phosphorus, total inorganic nitrogen, sodium, chloride, pH, and specific conductance. Monitoring shall be conducted quarterly until the permittee is notified by the Department that the monitoring can end or be reduced.

c. The permittee shall begin implementation of the monitoring plan within 90 days of approval of the monitoring plan, or upon installation of the monitoring well, whichever occurs last. The result of the monitoring shall be submitted to the Department quarterly.

d. Upon written notification by the Department that unacceptable leakage is impacting surface waters and/or groundwater, the permittee shall develop a work plan to address the leakage. Within 6 months of such notification, the permittee shall submit an approvable lagoon leakage remediation work plan to the Department. The purpose of the work plan is to control exfiltration from the lagoon treatment system. The study shall include remediation methods, procedures, time schedules, and staff, as appropriate.

e. The permittee shall begin implementation of the lagoon leakage remediation work plan within 30 days of approval of the work plan.

f. The permittee shall complete implementation of the lagoon leakage remediation work plan and submit an approvable final report with supporting data to the Department on or before within one year of approval of the work plan. The final report shall include a plan and schedule for continued maintenance and monitoring of the lagoon treatment system.

Based on the results of groundwater monitoring, the Department may require the permittee to obtain an individual permit, as described under Part 1.A.12 of this General Permit, to address compliance with R.323.2222 or surface water quality standards.

4. Additional Final Effluent Limitation for Total Phosphorus

If the Department determines it is necessary to control total phosphorus discharges to protect downstream water quality, the discharge shall be limited and monitored by the permittee as specified below. Such determination will be indicated in the COC.

	Maximum Limits for Quantity or Loading				Maximum Limits for Quality or Concentration					
Parameter	**Monthly**	**7-Day**	**Daily**	**Units**	**Monthly**	**7-Day**	**Daily**	**Units**	**Monitoring Frequency**	**Sample Type**
Total Phosphorous (as P)	---	---	---	---	1.0	---	---	mg/l	see A.1.d.5 above	Composite

5. Request for Discharge of Water Treatment Additives

In the event a permittee proposes to discharge water additives, the permittee shall submit a request to discharge water additives to the Department for approval. Such requests shall be sent to the Permits Section, Water Resources Division, Department of Environmental Quality, P.O. Box 30458, Lansing, Michigan 48909, with a copy to the Department contact listed on the COC. Instructions to submit a request electronically may be obtained via the internet (http://www.michigan.gov/deqnpdes; then click on Applicable Rules and Regulations, which is under the Information banner, and then click on Water Treatment Additive Discharge Application Instructions). Written approval from the Department to discharge such additives at specified levels shall be obtained prior to discharge by the permittee. Additional monitoring and reporting may be required as a condition for the approval to discharge the additive.

PART I

Section A. Effluent Limitations And Monitoring Requirements

A request to discharge water additives shall include all of the following water additive usage and discharge information:

a. Safety Data Sheet (formerly Material Safety Data Sheet);

b. the proposed water additive discharge concentration with supporting calculations;

c. the discharge frequency (i.e., number of hours per day and number of days per year);

d. the monitoring point from which the product is to be discharged;

e. the type of removal treatment, if any, that the water additive receives prior to discharge;

f. product function (i.e., microbiocide, flocculant, etc.);

g. a 48-hour LC_{50} or EC_{50} for a North American freshwater planktonic crustacean (either *Ceriodaphnia sp., Daphnia sp., or Simocephalus sp*.); and

h. the results of a toxicity test for one other North American freshwater aquatic species (other than a planktonic crustacean) that meets a minimum requirement of R 323.1057(2) of the Water Quality Standards.

Prior to submitting the request, the permittee may contact the Permits Section by telephone at 517-284-5568 or via the internet at the address given above to determine if the Department has the product toxicity data required by items g. and h. above. If the Department has the data, the permittee will not need to submit product toxicity data.

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

In accordance with Section 324.3112a of the NREPA, if untreated sewage, including sanitary sewer overflows (SSO) and combined sewer overflows (CSO), or partially treated sewage is directly or indirectly discharged from a sewer system onto land or into the waters of the state, the person responsible for the sewer system shall immediately, but not more than 24 hours after the discharge begins, notify by telephone the Department, 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 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 combined sewage, and if those municipalities wish to be notified in the same manner as specified above, the permittee shall provide such notification. Such notification shall also include a daily newspaper in the county of the affected municipality.

At the conclusion of the discharge, written notification shall be submitted in accordance with and on the “Report of Discharge Form” available via the internet at: http://www.deq.state.mi.us/csosso/, or, alternatively for CSO discharges, in accordance with notification procedures approved by the Department.

In addition, in accordance with Section 324.3112a of the NREPA, each time a discharge of untreated sewage 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 testing shall be done at locations specified by each affected local county health department, but shall not exceed ten 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. The results of this testing shall be submitted with the written notification required above, or, if the results are not yet available, submit them as

soon as they become available. This testing is not required if the testing has been waived by the local health department or if the discharge(s) did not affect surface waters.

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.

7. 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 ten days after replacement (including the name, address, telephone number, and e-mail address, if available, 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 described in the permit application or other NPDES form originates;
- 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 obviates the permittee from properly submitting reports and forms as required by law.

8. Monthly Operating Reports

For wastewater treatment facilities that serve the public, 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, reports showing the effectiveness of the treatment facility operation and the quantity and quality of liquid wastes discharged into waters of the state. If the Department has determined that this provision is applicable, it will be indicated in the COC.

FOR ALL **NEW** DISCHARGERS:
For new facilities: Sixty days prior to start-up of the treatment facility the permittee shall submit to the Department a treatment facility monitoring program to meet this requirement. Upon approval by the Department the permittee shall implement the treatment facility monitoring program. The report forms and guidance are available on the Department website at http://www.michigan.gov/deq/0,1607,7-135-3313_44117---,00.html. These forms shall be maintained on-site and shall be provided to the Department for review upon request. These treatment facility monitoring records shall be maintained for a minimum of three years.

FOR ALL **EXISTING** DISCHARGERS**:**
Within 30 days of the effective date of the COC the permittee shall submit to the Department a treatment facility monitoring program to meet this requirement. Upon approval by the Department the permittee shall implement the treatment facility monitoring program. The reporting forms and guidance are available on the Department website at http://www.michigan.gov/deq/0,1607,7-135-3313_44117---,00.html. These forms shall be maintained on-site and shall be provided to the Department for review upon request. These treatment facility monitoring records shall be maintained for a minimum of three years.

PART I

Section A. Effluent Limitations And Monitoring Requirements

9. Residuals Management Program (RMP) for Land Application of Biosolids: First RMP, including new uses (The individual COC indicates if applicable.)

A permittee seeking authorization to land apply bulk biosolids or prepare bulk biosolids for land application shall develop and submit a Residuals Management Program (RMP) to the Department (see Part I.A.9.e. of this General Permit) for approval. Effective upon Department approval of the permittee's RMP, the permittee is authorized to land apply bulk biosolids or prepare bulk biosolids for land application in accordance with the requirements established in R 323.2401 through R 323.2418 of the Michigan Administrative Code (Part 24 Rules), which can be obtained via the internet (http://www.michigan.gov/deq/ and on the left side of the screen click on Water, Biosolids & Industrial Pretreatment, Biosolids, then click on Biosolids Laws and Rules Information, which is under the Laws & Rules banner in the center of the screen). The permittee's approved RMP, and any approved modifications thereto, are enforceable requirements of this General Permit. Incineration, landfilling, and other residual disposal activities shall be conducted in accordance with Part II.D.7. of this General Permit.

a. RMP Approval and Implementation
A permittee seeking approval of an RMP shall submit the RMP to the Department (see Part I.A.9.e. of this General Permit) at least 180 days prior to the land application of biosolids. The permittee may utilize the RMP Electronic Form that can be obtained via the internet (http://www.michigan.gov/deq/, and on the left side of the screen click on Water, Biosolids & Industrial Pretreatment, Biosolids; then click on RMP Electronic Form, which is under the Downloads banner in the center of the screen) or obtain detailed requirements from the Department. The RMP shall become effective and shall be implemented by the permittee upon written approval by the Department.

b. Annual Report
On or before October 30 of each year, the permittee shall submit an annual report to the Biosolids Program, Water Resources Division, Department of Environmental Quality, P.O. Box 30458, Lansing, Michigan 48909-7958, for the previous fiscal year of October 1 through September 30. 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 Biosolids Annual Report Form, which can be obtained via the internet (http:/www.michigan.gov/deq/, and on the left side of the screen click on Water, Biosolids & Industrial Pretreatment, Biosolids; then click on Biosolids Annual Report Form, which is under the Downloads banner in the center of the screen) or from the Department.

c. Modifications to the Approved RMP
Prior to implementation of modifications to the RMP, the permittee shall submit proposed modifications to the Department (see Part I.A.9.e. of this General Permit) 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.

d. Recordkeeping
Records required by the Part 24 Rules shall be kept for a minimum of five 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.

e. Contact Information
RMP related submittals to the Department shall be to the address and telephone number listed in the COC.

PART I

Section A. Effluent Limitations And Monitoring Requirements

10. Residuals Management Program for Land Application of Biosolids: APPROVED RMPs (The individual COC indicates if applicable.)

The permittee is authorized to land apply bulk biosolids or prepare bulk biosolids for land application in accordance with the permittee's approved RMP approved on the date specified in the COC and approved modifications thereto, in accordance with 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 General Permit. Incineration, landfilling, and other residual disposal activities shall be conducted in accordance with Part II.D.7. of this General Permit. The Part 24 Rules can be obtained via the internet (http://www.michigan.gov/deq/, and on the left side of the screen click on Water, Biosolids & Industrial Pretreatment, 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 to the Biosolids Program, Water Resources Division, Department of Environmental Quality, P.O. Box 30458, Lansing, Michigan 48909-7958, for the previous fiscal year of October 1 through September 30. 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 Biosolids Annual Report Form, which can be obtained via the internet (http://www.michigan.gov/deq/ and on the left side of the screen click on Water, Biosolids & Industrial Pretreatment, Biosolids; then click on Biosolids Annual Report Form, which is under the Downloads banner in the center of the screen) or from the Department.

b. Modifications to the Approved RMP
Prior to implementation of modifications to the RMP, the permittee shall submit proposed modifications to the Department (see Part I.A.9.e. for this General Permit) 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 Retention
Records required by the Part 24 Rules shall be kept for a minimum of five 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 to the Department shall be to the address and telephone number listed in the COC.

11. Expiration and Reissuance

On or before October 1, 2018, a permittee seeking continued authorization to discharge under this General Permit beyond the permit's expiration date shall submit to the Department a written request containing such information, forms, and fees as required by the Department. Without an adequate request, a permittee's authorization to discharge will expire on April 1, 2019. With an adequate request, a permittee shall continue to be subject to the terms and conditions of the expired permit until the Department takes action on the request, unless this General Permit is terminated or revoked.

If this General Permit is terminated or revoked, all authorizations to discharge under the permit shall expire on the date of termination or revocation.

If this General Permit is modified, the Department will notify the permittee of any required action. Without an adequate response, a permittee's authorization to discharge will terminate on the effective date of the modified

permit. With an adequate response, a permittee shall be subject to the terms and conditions of the modified permit on the effective date of the modified permit unless the Department notifies the permittee otherwise. If a discharge is terminated, the permittee shall request termination of discharge authorization.

12. Requirement to Obtain Individual Permit

The Department may require any person who is authorized to discharge by a COC and this General Permit to apply for and obtain an individual NPDES permit if any of the following circumstances apply:

1) the discharge is a significant contributor to pollution as determined by the Department on a case-by-case basis;

2) the discharger is not complying or has not complied with the conditions of the permit;

3) a change has occurred in the availability of demonstrated technology or practices for the control or abatement of waste applicable to the point source discharge;

4) effluent standards and limitations are promulgated for point source discharges subject to this General Permit; and

5) the Department determines that the criteria under which the permit was issued no longer apply.

Any person may request the Department to take action pursuant to the provisions of Rule 2191 (R 323.2191 of the Michigan Administrative Code).

PART I

Section A. Effluent Limitations And Monitoring Requirements

13. Industrial Waste Pretreatment Program

It is understood that the permittee does not receive the discharge of any type or quantity of substance which may cause interference with the operation of the treatment works; and, therefore, the permittee is not required to immediately develop an industrial pretreatment program in accordance with Section 307 of the Federal Act. The permittee is required to comply with Section 307 of the Federal Act upon accepting any such discharge for treatment. The permittee is required to notify the Department within 30 days if any user discharges or proposes to discharge such wastes to the permittee for treatment.

Under no circumstances shall the permittee allow introduction of the following wastes into the waste treatment system:

a. pollutants which cause pass through or interference;

b. pollutants which create a fire hazard or explosion hazard in the sewerage system, including, but not limited to wastestreams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test methods specified in Title 40 of the Code of Federal Regulations (CFR) 261.21;

c. pollutants which will cause corrosive structural damage to the sewerage system; but in no case, discharges with pH less than 5.0, unless the works is specifically designed to accommodate such discharges;

d. solid or viscous pollutants in amounts which will cause obstruction to the flow in the sewerage system resulting in interference;

e. any pollutant, including oxygen demanding pollutants (BOD, etc.) released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the treatment plant;

f. heat in amounts which will inhibit biological activity in the treatment plant resulting in interference; but in no case, heat in such quantities that the temperature at the treatment plant exceeds 40 degrees Centigrade (104 degrees Fahrenheit) unless the Department, upon request of the permittee, approves alternate temperature limits;

g. pollutants which result in the presence of toxic gases, vapors, or fumes within the sewerage system in a quantity that may cause acute worker health and safety problems; and

h. any trucked or hauled pollutants, except at discharge points designated by the permittee.

If information is gained by the Department that the permittee receives or is about to receive industrial wastes, then the permittee may be required to obtain an individual permit (see Part I.A.12. of this General Permit).

14. Industrial Waste (for non POTWs such as mobile home parks, campgrounds, nursing homes and marinas)

Under no circumstances shall the permittee allow introduction of waste into the sewerage system other than domestic sewage generated by the facility named on the COC.

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.

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. 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.

Daily concentration is the sum of the concentrations of the individual samples of a parameter divided by the number of samples taken during any calendar day. If the parameter concentration in any sample is less than the quantification limit, regard that value as zero when calculating the daily concentration. The daily concentration will be used to determine compliance with any maximum and minimum daily concentration limitations (except for pH and dissolved oxygen). When required by the permit, report the maximum calculated daily concentration for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the Discharge Monitoring Reports (DMRs).

For pH, report the maximum value of any individual sample taken during the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs and the minimum value of any individual sample taken during the month in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs. For dissolved oxygen, report the minimum concentration of any individual sample in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

PART II

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 Environmental Quality.

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.

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.

Discharge point is the location where the point source discharge 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.

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.

Fecal coliform bacteria monthly is the geometric mean of the samples collected during a discharge event. Days with no discharge shall not be used to determine the 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 monthly value shall be reported on the DMR of the month in which the last day of discharge occurred.

Fecal coliform bacteria 7-day is the geometric mean of the samples collected in any 7-day period during a discharge event. The calculated 7-day value will be used to determine compliance with the maximum 7-day fecal coliform bacteria limitations. Days with no discharge shall not be used to determine the value. 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 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.

Flow proportioned sample is a composite sample with the sample volume proportional to the effluent flow.

General permit means a National Pollutant Discharge Elimination System permit issued 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.

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.

PART II

Interference is a discharge which, alone or in conjunction with a discharge or discharges from other sources, both: 1) inhibits or disrupts the 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].

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.

MGD means million gallons per day.

Monthly concentration is the sum of the daily concentrations determined during a discharge event 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. If the seven day period was partially in each of two months, the monthly average shall be reported on the DMR of the month in which the last day of discharge occurred.

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 discharge event. 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. If the seven day period was partially in each of two months, the monthly average shall be reported on the DMR of the month in which the last day of discharge occurred..

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.

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 Federal 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.

Outfall is the location of a point source discharge where storm water or treated wastewater is discharged directly to the surface waters of the state.

PART II

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 National Pollutant Discharge Elimination System 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 (R 324.2001 through R 324.2009 of the Michigan Administrative Code).

POTW is a publicly owned treatment works.

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.

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.

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 or ground waters of this 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)).

PART II

Significant materials 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 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 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).

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 Part I.D.3.

SWPPP means the Storm Water Pollution Prevention Plan prepared in accordance with Part I.C. of 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 Federal 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.

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

7-day concentration is the sum of the daily concentrations determined during any 7 days of discharge during a discharge event divided by the number of daily concentrations determined. If the number of days of the discharge event is less than 7 days the number of actual days of discharge 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 month in the “MAXIMUM” column under “QUALITY OR CONCENTRATION” on the DMR. If the seven 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.

PART II

7-day loading is the sum of the daily loadings of a parameter divided by the number of daily loadings determined during any 7 consecutive days. If the number of days of the discharge event is less than 7 days the number of actual days of discharge 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 month in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMR. If the seven day period in which the discharge event occurred 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.

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. A time-proportioned composite sample may be used upon approval of the Department if the permittee demonstrates it is representative of the discharge.

25-year, 24-hour rainfall event or **100-year, 24-hour rainfall event** means the maximum 24-hour precipitation event with a probable recurrence interval of once in 25 years or 100 years, respectively, as defined by the "Rainfall Frequency Atlas of the Midwest," Huff and Angel, Illinois State Water Survey, Champaign, Bulletin 71, 1992, and subsequent amendments, or equivalent regional or state rainfall probability information developed there from.

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 Federal 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. 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 Chief of the Permits Section, Water Resources Division, Michigan Department of Environmental Quality, 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 Control/Quality Assurance 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 General Permit including all records of analyses performed, and calibration and maintenance of instrumentation, and recordings from continuous monitoring instrumentation shall be retained for a minimum of three years, or longer if requested by the Regional Administrator or the Department as required by Part 21 of Act 451 of 1994, as amended, R 323.2155 of the Michigan Administrative Code.

PART II

Section C. Reporting Requirements

1. Start-up Notification for New or Upgraded Facilities

If the permittee will not discharge during the first 60 days following the effective date of the facility's COC, the permittee shall notify the Department within 14 days following the effective date of the COC, 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(3) and R 323.2155(2) of Part 21, allows 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 Electronic Environmental Discharge Monitoring Reporting (e2-DMR) system.

The permittee shall utilize the information provided on the e2-Reporting website at https://secure1.state.mi.us/e2rs/ 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 Department (Department as defined on the COC). 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 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 DMR. Such increased frequency shall also be indicated.

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

PART II

Section C. Reporting Requirements

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 Federal 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 days.

b. other reporting - The permittee shall report, in writing, all other instances of noncompliance not described in Part II.C.6.a. above at the time monitoring reports are submitted; or, in the case of retained self-monitoring, within five 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 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 in 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 ten 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 preventative measures taken or a schedule for completion of measures to be taken to prevent reoccurrence of similar releases.

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 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 Part II.C.9.b. or 9.c. below.

b. Notice of Anticipated Bypass - If the permittee knows in advance of the need for a bypass, it shall submit prior notice to the Department, if possible at least ten days before the date of the bypass, and 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 conditions listed in Part II.C.9.a. above.

c. Notice of Unanticipated Bypass - The permittee shall submit notice to the Department of an unanticipated bypass by calling the Department at the number indicated in the COC (if the notice is provided after regular working hours, use the following number: 1-800-292-4706) as soon as possible, but no later than 24 hours from the time the permittee becomes aware of the circumstances.

d. Written Report of Bypass - A written submission shall be provided within five 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.

Section C. Reporting Requirements

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 assure efficient operation. These bypasses are not subject to the provisions of Part II.C.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 General 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 ten 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 COC 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.

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 submission of an increased use request (application) and all information required under R 323.1098 (Antidegradation) of the Water Quality Standards; or b) by notice if the following conditions are met: 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; the action or activity will not result in violations of the effluent limitations specified in this permit; the action or activity is not prohibited by the requirements of Part II.C.10.; and the action or activity will not require notification pursuant to Part II.C.11.

Following such notice, the permit may be modified according to applicable laws and rules to specify and limit any pollutant not previously limited.

PART II

Section C. Reporting Requirements

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 General 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. Part 41 of Act 451 of 1994, as amended, specifically Section 324.4104 and associated R 299.2957, allow the Department to require an Operations and Maintenance (O&M) manual for the wastewater treatment facility. An up-to-date copy of the O&M manual shall be kept at the wastewater treatment facility. Upon request a copy of the O&M manual shall be provided to the Department. The Department may review the manual in whole or in part at their discretion and require modifications to it if portions are determined to be inadequate.

At a minimum, the O&M manual should include the following information: permit standards, description and operation information for all equipment, staffing information, laboratory requirements, record keeping requirements, maintenance plan for equipment, 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 operations and maintenance manual is required to be submitted to the Department at least 60 days prior to startup of a new wastewater treatment plant. Submittal of re-certifications will also be required 60 days prior to start-up of any substantial improvements or modifications made at the wastewater treatment plant.

15. Signatory Requirements

All applications, reports, or information submitted to the Department in accordance with the conditions of this General Permit or the facility's COC that require a signature shall be signed and certified as described in the Federal Act and the NREPA.

The Federal 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 General Permit or the facility's COC, 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 six months per violation, or by both.

PART II

Section C. Reporting Requirements

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 two 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 all such reports or notifications as requited by this permit, electronically.

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 and the facility's COC. The discharge of any pollutant identified in this permit and/or the facility's COC 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 and the facility's COC. Any noncompliance with the Effluent Limitations, Special Conditions, or terms of this permit or the facility's COC constitutes a violation of the NREPA and/or the Federal Act and constitutes grounds for enforcement action; for COC termination, revocation and reissuance, or modification; or denial of an application for 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.

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 General 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 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.

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 Publicly Owned Treatment Work (POTW), these facilities shall be approved under Part 41 of the NREPA.

PART II

Section D. Management Responsibilities

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:

a. to enter upon the permittee's premises where an effluent source is located or in which any 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 General 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 Federal 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 Federal 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 Federal 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 General Permit or to determine compliance with the 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. Facility Construction

This General Permit does not authorize or approve the construction or modification of any physical structures or facilities. Approval for such construction for a POTW must be by permit issued under Part 41 of the NREPA. Approval for such construction for a mobile home park, campground, or marina shall be from the Water Resources Division, Michigan Department of Environmental Quality. Approval for such construction for a hospital, nursing home, or extended care facility shall be from the Division of Health Facilities and Services, Michigan Department of Consumer and Industry Services upon request.

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 General 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 Federal 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 Federal 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 Environmental Quality permits, or approvals from other units of government as may be required by law.

APPENDIX H: Western U.P. District Health Department – Letter

Western Upper Peninsula District Health Department and Superior Home Health & Hospice Division
540 Depot Street, Hancock, Michigan 49930 Phone: (906) 482-7382

BRANCH OFFICES: 210 N. Moore St. Bessemer, MI 49911 Phone: 667-0200; 303 Baraga Ave. L'Anse, MI 49946 Phone: 524-6142; 408 Copper St. Ontonagon, MI 49953 Phone: 884-4485

February 16, 2009

Mr. Carl Bailey, Supervisor
Bergland Township
P.O. Box 326
Bergland, MI 49910

Re: Proposed Sanitary Sewer Extension
Bergland Township, Michigan

Dear Mr. Bailey;

The Western Upper Peninsula District Health Department supports Bergland Township's efforts to install sanitary sewers to businesses and residences located on the northern shore of Lake Gogebic. A modern sewage treatment and collection system will ensure the groundwater and surface water resources of the area are protected from contamination.

The area was developed many years ago with seasonal cabins, residential homes, and small business utilizing groundwater wells for drinking water and on-site sewage disposal. According to Bergland Township's records more than 90% of the two hundred existing homes and businesses to be served by the proposed sewers were constructed prior to 1975 and prior to the health department's adoption of a local sanitary code that regulated permitting of on-site sewage systems.

Prior to 1975 and the adoption of an effective local sanitary code, on-site septic systems were installed by property owners without health department oversight. Due to the age of the existing homes and businesses it can be assumed that most of them have inadequate sewage systems which lack the ability to treat wastewater as modern, well designed systems do. The developed lots are small in size, have high water table and marginal soil conditions at best for sewage treatment, and isolation to Lake Gogebic may be inadequate by today's standards. Replacement of aged and failing existing systems with new systems meeting current local sanitary code requirements is difficult or impossible due to site constraints.

More than 90% of the existing homes in the proposed sewer area have on-site sewage systems that have exceeded their expected useful lifespan of 25 to 30 years. Most of the aged systems were not designed to provide treatment of the wastewater prior to its discharge to the groundwater or surface water. In order to protect the groundwater and the surface water of Lake Gogebic from contamination which can cause human illness Bergland Township is encouraged to pursue funding opportunities to allow the township to upgrade sewage treatment.

If we can be of any assistance or if you have any questions regarding this letter, please contact the undersigned at 906-482-7382

Sincerely,

Lynne Madison

Lynne Madison, R.S.
Director, Environmental Health Division

APPENDIX I: USDA Review of Pre-application – Letter

USDA
United States Department of Agriculture

Rural Development

Gladstone Area Office

2003 Minneapolis Ave
Gladstone, MI 49837

Voice 906.428.1060
Fax 855.647.0826

September 17, 2018

Mr. Kelly Dunbar, Chairman
Lake Gogebic Area Sewer Authority
P.O. Box 43
Marenisco MI 49947

RE: Lake Gogebic Area Sewer Authority (Sewer)

Dear Mr. Dunbar:

This letter is being sent in response to a preapplication review that was submitted on the above project. It appears the applicant is eligible, however, before a final determination can be made the following items will need to be addressed.

Please respond with a plan to address these items within 30 days of the date of this letter.

1. Submit a Median Household Income Survey. The survey must be conducted by a reliable impartial source using the attached guide.

2. Submit a Resolution from each township to support the estimated high user rates as per the preliminary engineering report.

3. Has consideration been given to setting up a special assessment district that would allow for more revenue to offset a high monthly user cost in the preliminary engineering report?

4. Submit a Resolution from each township that they are agreeable to a Limited Tax General Obligation Bond pledging the full faith and credit of the townships for the bond payment. You may want to discuss with Bond Counsel for guidance and limitations on the bond issues.

5. Submit a Resolution from each township that they will pass and enforce a mandatory hook-up ordinance for sewer. The length of the mandatory hook-up will need to be long enough to include all buildings on both sides of the road.

6. According to the preliminary engineering report, Bergland Township will be treating sewage from the Authority's customers. However, there was no cost in the operating and maintenance budget for treatment. The user rates will need to increase to include the cost for the sewage treatment.

If you have any questions, please feel free to contact **BRENDA M. STEVENSON** at the address and phone number below.

Very truly yours,

BRENDA M. STEVENSON
AREA SPECIALIST

cc: RUS Division – State Office (email)
MDEQ – Karol Patton
Coleman Engineering

APPENDIX J: Letter from LGASA to USDA

October 1, 2018

USDA Rural Development
Brenda Stevenson, Area Specialist
Gladstone Area Office
2003 Minneapolis Ave
Gladstone, MI 49837

Re: LGASA USDA RD Pre-application Status

Dear Brenda:

Thank you for taking the time on 9/26/18 to explain your 9/17/18 pre-application review letter to the LGASA board and Coleman Engineering. After the call, LGASA discussed all of our options and has elected to not proceed any further with USDA funding at this time. It is the feeling of the Board, the range of potential user charges presented in the report appear to be more than the residents would be willing to pay for the project as it is currently defined. We plan on continuing our search for grant opportunities and ways to make this project affordable to our users.

Please feel free to contact me with any questions or comments you may have at DunbarK1@michigan.gov.

Sincerely,

Kelly Dunbar
LGASA Chairman

Cc: Valorie White, MDEQ
Paul Anderson, Coleman Engineering

APPENDIX K: Letter from LGASA to MDEQ

October 1, 2018

MDEQ
Valorie White
PO Box 30817
Lansing, MI 48909-8311

Re: Bergland SAW Planning Grant Status

Dear Ms. White:

Bergland Township in cooperation with Marenisco Township and the Lake Gogebic Sewer Authority (LGSA) has received and reviewed the SAW Planning Grant reports prepared by Coleman Engineering Company. The Plan for installing municipal sewer on the west side of Lake Gogebic was prepared in the form of a USDA Rural Development funding Pre-Application. The main portion of the Pre-Application was the Preliminary Engineering Report that defined the project extents and basic technical considerations, estimated construction costs, estimated number of users and presented financial analysis. We received a review letter dated September 17, 2018 from USDA Rural Development which presented various administrative issues that would need to be addressed in order to proceed further with their funding. These administrative issues were tied to USDA funding program requirements and not necessarily to the project technical requirements or cost estimates. We discussed the Pre-Application and review letter in a phone call with USDA Rural Development on September 26, 2018. After the call, Bergland Township, Marenisco Township and LGSA discussed all of our options and has elected to not proceed any further with USDA funding at this time. It is the feeling of the Board, the range of potential user charges presented in the report appear to be more than the residents would be willing to pay for the project as it is currently defined. We plan on continuing our search for grant opportunities and ways to make this project affordable to our users. As such, the timeframe for proceeding with the project will remain undefined.

Please feel free to contact me with any questions or comments you may have at 906.365.0543.

Sincerely,

Dave Roberts
Bergland Township Supervisor

Cc: Paul Anderson, Coleman Engineering