
City of Potterville



Capital Improvement Plan

April, 2021

Table of Contents

1. Executive Summary.....	4
2. Background and Purpose	4
3. Asset Inventory	5
3.1 Storm Water System	5
3.1a Catchment 1.....	6
3.1b Catchment 2.....	6
3.1c Catchment 3.....	6
3.1d Catchment 4.....	6
3.1e Catchment 5.....	6
3.1f Catchment 6.....	6
3.1g Catchment 7.....	6
3.1h Catchment 8.....	6
3.2 Wastewater Collection and Treatment System	7
3.2a Gravity Sewer and Manholes.....	7
3.2b Lift Station.....	7
3.2c Wastewater Treatment Plant	8
3.3 Water Supply System	9
3.4 Roads & Sidewalks.....	10
4. Condition Assessment & Capital Improvement Plan	11
4.1 Storm Water System	11
4.2 Wastewater Collection and Treatment System	11
4.2a Gravity Sewer.....	11
4.2a Lift Station & WWTF	13
4.3 Water System	13
4.3a Well No. 5 & Iron Removal Plant	13
4.3b 350,000 Gallon Elevated Storage Tank	14
4.3c Expanded Iron Removal at Well No. 4	14
4.3d 5,000 feet of 12-inch Water Main from Alro Park Dr. to Hartel Rd.....	14
4.3e 6,000 feet of 12-inch Water Main from Hartel Rd. to Pine Hill Dr.	14
4.4 Roads & Sidewalks.....	14
4.4a Road Maintenance.....	15
4.4b Road Reconstruction.....	15

4.4c	Sidewalk & Non-Motorized Trail Construction	16
5.	Revenue Structure & Funding Analysis	16
5.1	Storm System	16
5.2	Wastewater System	17
5.3	Water System	17
5.4	Roads & Sidewalks	17
5.4a	Major Street Fund	18
5.4b	Local Street Fund	18
6.	Funding Opportunities	18
6.1	Grants	18
6.1a	EDA	18
6.1b	MDOT Transportation Alternatives Program (TAP)	18
6.1c	Michigan Safe Routes to School (SRTS)	18
6.1d	Passport Grant	18
6.1e	Green Project Reserve (GPR) Grants	18
6.2	Loans	19
6.2a	Clean Water State Revolving Fund (CWSRF)	19
6.2b	USDA Rural Development (USDA-RD)	19
6.3	Bonds	19
6.3a	Special Assessment Bonds	19
6.3b	Revenue Bonds	19
6.3c	Contract Bonds	19
7.	Appendix A – Reports	20
8.	Appendix B – Maps	20

1. Executive Summary

This report proposes a capital improvement plan for the City of Potterville. The plan includes the storm water system, the wastewater collection and treatment system, the water production and distribution system, and the road and sidewalk network. The asset values of all these utilities were estimated to illustrate the investment Potterville has made into its own utilities. From there, a condition assessment was performed and an improvement plan was made. The planning period for this study was 20 years. The costs of the projects are all based on estimated construction costs and dollar values at the end of 2020.

From the analysis, it was estimated that the city storm water system has a value of approximately \$4.7 million. The storm water system does not have any recommended improvements based on its current condition. However, the system will most likely require improvement as unforeseen problems arise. The wastewater collection and treatment system is valued at \$9.1 million and will require approximately \$460,000 of work on the collection system and \$1.7 million on the lift station and treatment system. The water production and distribution system has an approximate value of \$14.1 million. The proposed water system projects amount to about \$5.7 million, with \$3.4 million of this work being necessary within 5 years and the other \$2.3 million being suggested within 20 years for improved system redundancy. The road and sidewalk network is valued at \$5.5 million. A road maintenance plan was recommended that spends approximately \$60,000 per year on road preservation. In addition, six road reconstruction projects were proposed that should be completed as soon as the money is available.

The city has funds devoted to each of these systems to pay for operation and maintenance as well as capital improvements. It will be up to the city to determine whether the existing revenues will be sufficient for these projects, or whether additional funding will be required. A list of potential funding opportunities is included for reference.

2. Background and Purpose

The City of Potterville is located in the southern central region of Michigan, in the northeast quadrant of Eaton County. The city contains residential, commercial, and industrial regions within its overall area of 2 square miles. The single campus of the Potterville Public School district is in the city as well as four parks and various restaurants and shops. A continually growing trail network in the city provides an asset for residents to travel around the various attractions. Furthermore, many of the residential housing developments have the capacity to expand to allow more people to move into the city. There is also land available for future commercial or industrial businesses.

In order to provide the best possible experience to its residents and local businesses, Potterville expressed an interest in studying all of its utility assets to find the level of service they provide. The utilities included in this study are the stormwater conveyance system, wastewater collection system, wastewater treatment facility, water production system, water distribution network, roads, sidewalks, and non-motorized trails. Each of these was studied in detail to find its value, assess its current condition, evaluate its quality, and plan for future maintenance or improvement.

The water production and distribution system was studied extensively in the 2020 Potterville Water Reliability Study that was performed recently. Furthermore, the roads, sidewalks, and trails in the city were assessed in the 2020 Road Asset Management Plan. Both of these reports go into detail on the

current condition of the assets to those systems and propose future work to maintain and improve them. This report will only summarize the asset values and improvement plan outlined in those reports.

This report will focus on the wastewater and stormwater systems that are located in the city. The overall purpose is to propose a plan that will most sustainably protect the investment the city has put into its utilities. The report will clearly and transparently show value of the city's utilities and provide a plan for future upgrades. This plan is specific to Pottersville in order to ensure its appropriateness for implementation by the city.

3. Asset Inventory

3.1 Storm Water System

The City of Pottersville has a storm sewer system consisting of about 72,000 feet of sewer pipes of various sizes, 166 manholes, 536 catch basins, and 14 flared end sections. These storm water assets are listed in Table 1 with their approximate values. The value of each asset is the amount of money it would cost to replace it in 2020 not including incidental items such as road replacement and project administration. The storm system also makes use of both natural and manmade ponds, ditches, and streams; however, those are not included in this study because the city does not construct or maintain them. The notable items in this category include Abel Drain, Alliance Lake, various detention ponds, Carmen Drain, Lansing Road Ditching, and the Thornapple River.

Table 1: Stormwater System Assets

Item	Amount	Unit	Price	Value
Culvert	1,426	Feet	\$40	\$279,000
3-inch Storm	129	Feet	\$20	\$3,000
4-inch Storm	482	Feet	\$25	\$12,000
6-inch Storm	1,784	Feet	\$25	\$45,000
8-inch Storm	8,621	Feet	\$30	\$259,000
10-inch Storm	1,788	Feet	\$30	\$41,000
12-inch Storm	36,944	Feet	\$40	\$939,000
15-inch Storm	2,374	Feet	\$40	\$256,000
18-inch Storm	1,128	Feet	\$45	\$314,000
21-inch Storm	1,494	Feet	\$45	\$67,000
24-inch Storm	6,824	Feet	\$50	\$307,000
30-inch Storm	3,761	Feet	\$55	\$228,000
36-inch Storm	4,525	Feet	\$60	\$274,000
42-inch Storm	461	Feet	\$65	\$30,000
48-inch Storm	1,898	Feet	\$70	\$140,000
Manhole	166	Each	\$2,000	\$332,000
Flared End Sections	14	Each	\$1,000	\$71,000
Catch Basins	536	Each	\$2,000	\$1,072,000
			Total	\$4,669,000

The storm sewer is grouped into 8 main drainage basins or catchments. Though these catchments do not contain all of the area of the city, they do represent the entirety of storm sewer infrastructure in the city. A map showing the location of these catchments is included in Appendix B.

3.1a Catchment 1

Catchment 1 is located on the west side of the city south of Vermontville Highway. It collects water from the Lockview Meadows and Country Lake developments as well as from Vermontville Highway. It discharges water into the northeast side of Alliance Lake. This area includes the Potterville Drain which is owned by the city. The drain is a large diameter sewer system that runs from near the intersection of Nelson St and Vermontville Highway down Remway Street to Alliance Lake.

3.1b Catchment 2

Catchment 2 is the area around Wright Industrial Parkway. The stormwater from this area is directed into a swale that flows around Alliance Lake Park and discharges into a detention pond southeast of the park before being let into the Thornapple River.

3.1c Catchment 3

Catchment 3 contains a significant part of the city including Potter Drain. This drain is owned by the Eaton County Drain Commission and starts from near the intersection of M-100 and Lansing Road. It runs on the east side of Lansing Road then crosses near Pearl St and flows towards Main Street. It runs down Main Street to the west before crossing the CN Railroad to the north and discharging to Abel Drain. The catchment roughly includes the area south of Vermontville Hwy east of Nelson St and north of Vermontville East of Church St.

3.1d Catchment 4

Catchment 4 is the northwest side of downtown Potterville. It contains a number of storm sewers that connect and cross the CN Railroad through a 42-inch sewer northeast of Main Street and Nelson St. The sewer discharges to a detention pond that drains to Abel Drain.

3.1e Catchment 5

Catchment 5 is the Sunset Drive Extension. It has a few small storm sewers that collect stormwater and discharge to Abel Drain.

3.1f Catchment 6

Catchment 6 is the central part of Sunset Drive from Pine Hill Drive to Hill Top Drive. This area discharges stormwater to the wetlands located east of the city wastewater treatment facility. These wetlands drain to Abel Drain.

3.1g Catchment 7

Catchment 7 is the northeast part of Sunset Drive and Pine Hill Drive. These areas discharge stormwater to a detention pond just south of the intersection of Pine Hill Drive and Sunset Drive. This detention pond drains through a sewer that discharges to Abel Drain on the west side of the city wastewater treatment facility.

3.1h Catchment 8

Catchment 8 is the area of Independence Commons. This area has privately owned storm sewer that drains to two detention ponds located on the south side of the community. The detentions ponds discharge directly to Alliance Lake.

3.2 Wastewater Collection and Treatment System

The wastewater system consists of three main parts: the gravity sewer and manholes, the lift station and force main, and the wastewater treatment facility (WWTF).

3.2a Gravity Sewer and Manholes

i. System Overview

The gravity collection system consists of about 60,000 feet of gravity sewer pipe of various sizes and 343 manholes. The gravity system can be neatly divided into two sections. The sewer north of the Vermontville Highway other than from a small part of Cherry, Pinetree, and Pearl Streets flows by gravity to a 15-inch sewer carries all the wastewater to the WWTF. The sewer south of Vermontville Highway and the small parts of Cherry, Pinetree, and Pearl Streets flows by gravity to a lift station located at the end of Tim's View Street. That lift station pumps wastewater through a force main that runs to the WWTF. The manholes and sewer are identified based on whether the sewer discharges to the treatment facility (TF) or to the lift station (LS) as well as the branch and number of the item. A map included in Appendix B shows the identification and overall layout of the wastewater collection system.

ii. Materials

The sewer pipe is constructed of either polyvinyl chloride (PVC) or vitrified clay pipe (VCP) that has been rehabilitated with a cured-in-place pipe (CIPP) lining. CIPP lining is a way of restoring existing pipes without open-cut excavating. About 26,000 feet of the 60,000 feet of gravity sewer pipe has been CIPP lined. Maps in Appendix B show the year the pipes were installed or restored and the material of the pipe. These sanitary sewer assets are itemized in Table 2. The table also shows the estimated replacement value of all the assets.

iii. Consequence of Failure

In order to aid in the system maintenance, a map was created that estimates the consequence associated with the failure of any part of the system. A sewer that handles less than 10 properties is assigned a rating of 1 and a sewer that handles about 25% or more of the system is rated a 5. This creates a visual representation of the most critical sewer infrastructure to keep maintained. It can be used as a tool to evaluate the necessity of specific projects.

3.2b West Side Lift Station

Potterville's only collection system lift station is a submersible lift station located at the end of Tim's View Street. The 8-foot diameter wet well has two pumps, their discharge pipes, and a mix/flush valve. An adjacent valve vault houses isolation valves for the pumps and a recirculation line. The force main from the station passes through a cleanout and bypass manhole after leaving the valve vault. The force main from the lift station to the wastewater treatment plant is 3,926 feet long. The force main is made up of 971 feet of asbestos cement pipe followed by 2,955 feet of ductile iron pipe. The lift station was updated in 2014 with new pumps. Cutters and mix flush valves were installed on these pumps in 2020 to reduce clogging and settlement issues. The station has a permanent standby generator and a local control panel. A lift station report is included in Appendix A of this report.



Figure 1: West Side Lift Station

3.2c Wastewater Treatment Facility

The City of Potterville wastewater system includes a wastewater treatment facility located west of the city off of Vermontville Highway to the north. The facility consists of a perforated basket screen, an influent pump station, two aeration cells, two wastewater storage cells, one clarifier, and two sludge storage lagoons. There are also two abandoned storage cells located on the site. The wastewater treatment plant was originally constructed in 1979 and updated in 2017. In the update the clarifier mechanism, weirs, troughs, and baffles were replaced, the influent pumping station was improved with new pumps, controls, and VFDs; the influent basket screen was installed; wastewater storage pond no. 1, both aerated lagoons, and sludge storage pond no. 1 were cleaned out; the aerators on the aerated lagoons were replaced; and facility electrical system was upgraded. A treatment facility report is included in Appendix A, and a map of the facility is included in Appendix B.



Figure 2: Potterville WWTF Clarifier

Table 2: Wastewater System Assets

Item	Amount	Unit	Price	Value
6-inch Sanitary	84	Feet	\$40	\$3,000
8-inch Sanitary	42,733	Feet	\$50	\$2,114,000
10-inch Sanitary	10,153	Feet	\$55	\$602,000
12-inch Sanitary	347	Feet	\$60	\$21,000
15-inch Sanitary	6,637	Feet	\$65	\$411,000
8-inch Force Main	3,919	Feet	\$65	\$255,000
Manholes	343	Each	\$3,000	\$1,020,000
Lift Station	1	Each	\$700,000	\$700,000
Wastewater Treatment Plant	1	Each	\$4,000,000	\$4,000,000
			Total	\$9,126,000

The wastewater collection system serves all of the residents within the city of Pottersville. Because of this, the city has made it a priority to maintain proper function of the system at all times. That goal is achieved a number of ways. Because much of the city is on gravity sewer, there is a lower likelihood of a mechanical failure causing sewer backups for that part of the system. The WWTF and lift station have a Mission dialer system that will alert city officials if anything goes wrong with them. There is always a city employee on call in case of an emergency. Regular cleaning and maintenance of the WWTF and lift station also limit the emergencies that occur.

3.3 Water Supply System

The water supply system consists of one elevated storage tank, four production wells (two of which are active), two iron removal plants, and a network of pipes, services, valves, and hydrants. The Pottersville Water Reliability Study goes into detail on all of these, but Table 3 summarizes the assets in the water system and their values.

Table 3: Water System Assets

Item	Amount	Unit	Price	Value
6-inch water main	395	Feet	\$100	\$39,500
8-inch water main	37,982	Feet	\$120	\$4,557,900
10-inch water main	155	Feet	\$140	\$21,700
12-inch water main	31,758	Feet	\$160	\$5,081,200
16-inch water main	1,383	Feet	\$200	\$276,600
Elevated storage tank	1	Each	\$1,500,000	\$1,500,000
Hydrants	132	Each	\$3,000	\$396,000
Valves	211	Each	\$1,500	\$316,500
Inactive Production well	2	Each	\$0	\$0
Active production well	2	Each	\$500,000	\$1,000,000
Iron Removal Plant	2	Each	\$450,000	\$900,000
			Total	\$14,089,400



Figure 3: 300,000 Gallon Elevated Storage Tank

3.4 Roads & Sidewalks

The city of Potterville owns a street, sidewalk, and non-motorized trail network. It consists of 2.90 miles of major roads, 9.19 miles of local roads, 12.64 miles of concrete sidewalk, and 1.24 miles of paved non-motorized trails. The 2020 road asset management plan goes into detail on these assets and the condition of each. A summary of the values of each is shown in Table 4.



Figure 4: Sunset Drive Extension & Non-Motorized Trail

Table 4: Road, Sidewalk & Trail Assets

Item	Amount	Unit	Price	Value
Major Road	2.90	Miles	\$701,400	\$1,466,000
Local Road	9.19	Miles	\$251,700	\$2,313,000
Sidewalk	12.64	Miles	\$120,000	\$1,517,000
Non-Motorized Trail	1.24	Miles	\$175,000	\$217,000
			Total	\$5,513,000

4. Condition Assessment & Capital Improvement Plan

4.1 Storm Water System

The storm sewer in the city is in good condition overall. Approximately 80% of the system was replaced in a large reconstruction project from 2014 to 2017. The rest of the system has been operating without problems. The city did not propose any projects to the storm water system at this time and none were found based on the condition assessment of the system. A regular visual inspection and cleaning schedule should be maintained to ensure that the system is operating well and no improvements are needed. The City will upgrade parts of the system as needed based on these inspections. Improvements to storm sewer will be completed as part of larger projects when it makes sense. This limits the amount of capital needed for the projects because much of the excavation and restoration is incidental to water main or sewer replacement.

4.2 Wastewater Collection and Treatment System

4.2a Gravity Sewer

In the same project that the storm sewer was replaced, all of the old sanitary sewer was either replaced or rehabilitated with a CIPP lining. This was done for all the vitrified clay pipe in the city. Because all of the gravity sewer in the city is either PVC or CIPP lined, there are no known construction projects required. However, the city would like to regularly televise the sewers to inspect them. They have already begun this project, and have found a number of spot repairs to complete. The following work items have been proposed:

i. Televise Sewer

The televising inspection consists of flushing the gravity sewer with high-pressure water to wash out settled debris and clean pipe walls. After the water flush, a robotic camera is driven down the pipe and any defects in the pipe will be televised and noted. All televised sewers are graded on a 1-5 scale based on PACP standards.

The oldest areas of sewer are in Sunset Hills, Lockview Meadows, Wright Industrial Parkway, along Lansing Road, and at the WWTF. These sewers could have sags, debris, encrustation, or other issues in the lines. For this reason, they should be televised. From the videos, a work plan can be created that will most likely involve several spot repairs on those lines.

The 0-5 year plan includes televising the Sunset Hills development, Lockview Meadows development and Wright industrial parkway sewers.

The 5-10 year plan includes televising the sewer along Lansing Rd.

ii. CIPP Linings

CIPP lining is a cost-effective way to rehabilitate old sewers without the need to excavate and replace them. It works by inserting and curing a plastic sleeve inside the existing pipe. It can be done in hours to minimize down time of the utility. The resulting pipe is joint-free, resistant to chemical breakdown, and structurally sound. The process can bridge breaks and holes in the original pipe as well as transition through offset joints. After the lining is cured with steam or hot water, a robot cutter is sent in to cut out laterals and restore service.

Some of the sewers in Potterville should be CIPP Lined to solve problems that are found with the entire pipe section such as infiltration, old material, or multiple joint problems.

The 5-10 year plan includes CIPP lining all of sewer lines located on the treatment facility property including the 10-inch sewer that runs to the south and the 15-inch sewer east until it connects with the 10-inch from Sunset Drive.



Figure 5: CIPP Lined Sewer with Lateral

iii. CIPM Linings

Some manholes on the system that are in poor condition or that have excessive infiltration can be lined with a plastic coating. This is done in a very similar manner to the cured-in-place pipe lining. A plastic liner is inserted into the manhole and cured with steam or hot water. After curing, the existing pipe openings are cut out to restore service. This should be done in areas of high groundwater or where the interior of a manhole is deteriorating.

The 5-10 year plan includes lining 2 manholes the locations of which are to be determined after televising and inspection.

iv. Spot Repairs

The 10-20 year plan includes repairing all sanitary lines and manholes that were observed to have defects during the televising. The number of repairs is estimated in Table 5 based on previous experience with similar projects.

Table 5: Sanitary Sewer Capital Improvement Plan

Time Frame	Action	Amount	Unit	Price	Cost	Yearly Sum
0-5 Years	Televise Sunset Hills	5,487	Feet	\$5	\$28,000	\$59,000
0-5 years	Televise Lockview Meadows	4,711	Feet	\$5	\$23,000	
0-5 years	Televise Wright Industrial Parkway	1674	Feet	\$5	\$8,000	
5-10 Years	CIPP Line Sanitary line to WWTF	6,083	Feet	\$50	\$304,000	\$324,000
5-10 Years	Televise Line Along Lansing Road	4,029	Feet	\$5	\$20,000	
5-10 Years	Manhole Lining	2	Each	\$3,000	\$6,000	
10-20 Years	Spot Repairs in Sunset Hills	3	Each	\$5,000	\$15,000	\$75,000
10-20 Years	Spot Repair in Lockview Meadows	3	Each	\$5,000	\$15,000	
10-20 Years	Spot Repair in downtown	5	Each	\$5,000	\$25,000	
10-20 Years	Spot Repair line along Lansing Road	2	Each	\$5,000	\$10,000	
10-20 Years	Spot Repair in Country Lake	2	Each	\$5,000	\$10,000	
					Total	\$458,000

4.2a Lift Station & WWTF

In addition to the sewers, the lift station and treatment facility require consistent maintenance and improvement to keep them operating effectively. The lift station is in good condition and has been upgraded recently. It should only require one pump replacement in the foreseeable future. The WWTF was is still in good condition since its upgrade in 2017. It is in need of a new generator soon, but the recent upgrade took care of all the rest of the needed improvements. Closer to 20 years from now, it will require sludge removal, pump replacement, and aerator replacement. Table 6 shows these costs.

Table 6: Wastewater Treatment Facility Capital Improvement Plan

Time Frame	Action	Amount	Unit	Price	Cost	Yearly Sum
0-5 Years	Replace Generator at WWTF	1	Each	\$200,000	\$200,000	\$200,000
10-15 Years	Lift Station Pump Replacement	2	Each	\$60,000	\$160,000	\$160,000
15-20 Years	WWTF Sludge Removal	1	LS	\$350,000	\$350,000	\$1,350,000
15-20 Years	WWTF Upgrades	1	LS	\$1,000,000	\$1,000,000	
					Total	\$1,710,000

4.3 Water System

A number of water system deficiencies and recommended upgrades were proposed in the 2020 Water Reliability Study. A summary of those items is included here, but a cost breakdown and background is included in that report.

4.3a Well No. 5 & Iron Removal Plant

The water supply for the city will not be adequate for future demand. According to population growth estimates, the water demand in the city will exceed the current firm capacity of 340 gpm by 2030. An additional well will be required to meet these demands. Pottersville has already begun

the process of installing a well. They have found a location and tested the groundwater. They are waiting for the final property acquisition before finalizing the process. The well will require treatment for iron and arsenic removal.

4.3b 350,000 Gallon Elevated Storage Tank

The existing water storage tank in the city is not large enough to fulfill ISO recommended fire flows and durations. Adding a second 350,000-gallon storage tank in addition to Well No. 5 would bring the city into compliance with these standards as well as add redundancy to the system in case of a component failure.

4.3c Expanded Iron Removal at Well No. 4

The iron removal plant at Well No. 4 was repurposed from use with a different well. It is not large enough to serve the entire capacity of Well No. 4. The water supply for the city could be increased by expanding the treatment at Well No. 4.

4.3d 5,000 feet of 12-inch Water Main from Alro Park Dr. to Hartel Rd.

To improve water quality and ensure multiple water sources to every customer in the city, a water main loop could be installed from the end of Alro Park Dr. to Hartel Rd.

4.3e 6,000 feet of 12-inch Water Main from Hartel Rd. to Pine Hill Dr.

The entirety of the Sunset Hills development is fed through a single water main. To improve redundancy to this development, a water main loop could be created by installing water main from Hartel Rd north to Gresham Hwy then down to the end of Pine Hill Drive.

Table 7: Water System Capital Improvement Plan

Time Frame	Action	Amount	Unit	Price	Cost	Yearly Sum
0-5 Years	Well No. 5 & Iron Removal Plant	1	LS	\$981,000	\$981,300	\$3,692,800
0-5 Years	350,000 Gallon Elevated Storage Tank	1	LS	\$2,500,000	\$2,511,500	
0-5 Years	Expanded Iron Removal at Well No. 4	1	LS	\$200,000	\$200,000	
5-20 Years	5,000 feet of 12-inch Water Main from Alro Park Dr. to Hartel Rd.	1	LS	\$948,800	\$948,800	\$2,007,600
5-20 Years	6,000 feet of 12-inch Water Main from Hartel Rd. to Pine Hill Dr.	1	LS	\$1,058,800	\$1,058,800	
					Total	\$5,700,400

4.4 Roads & Sidewalks

There were various recommended improvement projects in the city for the roads, trails, and sidewalks. These are both projects that are desired by the city and projects that are recommended based on observed conditions. The city wants to focus both on protecting the road investment that it made with the recent construction project, but also continue to improve roads that are deteriorating. The following plan illustrates that intent.

4.4a Road Maintenance

In order to keep recently constructed roads in good condition, they should be sealed on a regular basis. Within 5 years of construction, an overband crack sealing should be done to fill in any cracks that have formed in the road. 5-10 years after that, another crack seal should be placed followed by a chip seal and fog seal to give the road a new wearing surface. This treatment should be repeated on a 5-10 year schedule. This type of maintenance will keep the road surface in good condition and extend its usable life. The following table 8 shows the next 9 years of maintenance. This will complete the process for the recent construction project, but any newly constructed roads should be added to this schedule.

Table 8: Road Maintenance Table

Year	Roads	Construction	Total Length (Inmi)	Cost
2021	Church, Cottage, Cherry (East of Dunbar), Pearl (East of Dunbar), Benton, Walnut, High, Dawn, Vermontville, Sunset Extension	Overband Crack Seal	12.22	\$67,000
2022	Main, Pinetree	Overband Crack Seal, Chip Seal & Fog Seal	1.95	\$54,000
2023	Folk, Cormack, Remway (East of Thornway), Cherry (West of Dunbar), Pearl (West of Dunbar)	Overband Crack Seal, Chip Seal & Fog Seal	1.91	\$53,000
2024	Nelson, Dunbar	Overband Crack Seal, Chip Seal & Fog Seal	2.38	\$66,000
2025	Cottage, Church	Overband Crack Seal, Chip Seal & Fog Seal	2.14	\$59,000
2026	Vermontville	Overband Crack Seal, Chip Seal & Fog Seal	2.21	\$61,000
2027	Cherry (East of Dunbar), Pearl (East of Dunbar)	Overband Crack Seal, Chip Seal & Fog Seal	1.94	\$54,000
2028	Benton, Walnut, High, Dawn	Overband Crack Seal, Chip Seal & Fog Seal	1.39	\$39,000
2029	Sunset Extension	Overband Crack Seal, Chip Seal & Fog Seal	1.90	\$53,000

4.4b Road Reconstruction

Some of the roads in the city have degraded beyond the condition to be sealed. These will need to have the asphalt completely replaced. The existing surface of these roads will be milled away down to the surface of the aggregate below. In some cases, the milled asphalt could be used to enhance and strengthen the aggregate by mixing them. After a solid base is formed, asphalt will be replaced on the roads. After that, these roads should be added to the maintenance schedule to keep them usable and extend their service life. Table 9 shows the roads in need of reconstruction. The priority of them is shown by the order in the table.



Figure 6: Road with Chip Seal and Fog Seal

Table 9: Road Reconstruction Table

Priority	Road	Lane Miles	Construction Type	Cost
1	Pine Hill Drive	0.86	Mill & Fill	\$98,588
2	Sunset Drive	1.96	Mill & Fill	\$216,325
3	Country Lake Drive	0.44	Mill & Fill	\$74,127
4	Thornway Street	0.24	Mill & Fill	\$77,191
5	Remway Drive	0.33	Mill & Fill	\$55,531
6	Lauren's Way	0.46	Mill & Fill	\$76,792

4.4c Sidewalk & Non-Motorized Trail Construction

The city is always looking to improve non-motorized travel through the city. They already have a large network of trails that extend from Alliance Lake Park and Pottsville Park. A project has been conceived to connect these trails together through the city. This would both extend the usable length of trail and improve the ability to navigate the city without a car. Because this project is still in the early stages of development, there is not a clear plan on the route or type of trail to be constructed. For this reason, a cost estimate was not created for the construction of this project.

5. Revenue Structure & Funding Analysis

5.1 Storm System

The City of Pottsville has a storm drain maintenance fund; however, there is no direct revenue source for it. The money used for the storm system is transferred from the general fund. In most years, there is very little if any storm system work to do. The capital improvement plan proposed

in this report shows no work to be done. If any required projects arise in the future they will be combined into a larger, funded project. This will decrease the amount needed to repair the storm sewer compared to paying for a stand-alone project. The general fund will have sufficient money to pay for improvements like this.

5.2 Wastewater System

The revenue for the sanitary sewer fund comes from sewer rates charged to residents. The city reviews these rates on yearly basis to keep costs low. The 2020 monthly sewer rates are seen in Table 8. The sewer rates are based on the water meter size and water usage of the user. Generally, the water meter size corresponds to water use and wastewater production. All money collected from these rates goes into the sanitary sewer fund.

Table 10: Monthly Sewer Fees

Service Size	Ready to Service Fee
5/8"	\$30.33
1"	\$90.03
2"	\$134.40
4"	\$625.00
6"	\$6,521.40

\$2.95 per 1,000 gallons of water used

5.3 Water System

The city has a water fund that is funded primarily from bills and fees charge to water users within the city. There are one-time connection fees and monthly usage and ready-to service feeds. Table 11 shows the current monthly fees for the city.

Table 11: Monthly Water Fees

Service Size	Ready to Service Fee
5/8"	\$26.40
1"	\$69.30
2"	\$124.78
4"	\$479.50
6"	\$4,788.10

\$3.89 per 1,000 gallons of water used

The water service fees do not create much of a balance in the water fund each year. Although the water fund has about \$2.7 million at the beginning of 2021, this is not enough money to complete all the projects in the capital improvement plan. External funding will be required to complete the 0-5 year plan.

5.4 Roads & Sidewalks

The roads and sidewalks have two funds associated with them, the major street fund and the local street fund.

5.4a Major Street Fund

The major street fund is primarily used to pay for projects on the major streets (Main St, Vermontville Hwy, Wright Industrial Pkwy, Dunbar St, & Alro Park Dr). It is funded from special assessment districts, Act 51 deposits, and road millages. Transfers in from the general fund also help to pay for allocations as required.

Some of the money from the major street fund is transferred to the local street fund to pay for projects on those roads. Because local streets make up the majority of Pottersville's roadways, the local streets generally require more funding than the major streets do.

5.4b Local Street Fund

The local street fund is also funded from special assessment districts, Act 51 deposits, and road millages. Money is transferred in from the major street fund and the general fund. Because Pottersville requires all local streets be constructed to MDOT standards, they are allowed to use Act 51 money deposited into the major streets fund on local road projects. The local street fund is also what is used to pay for sidewalk and trail projects within the city.

6. Funding Opportunities

6.1 Grants

6.1a EDA

The Economic Development Administration (EDA) provides grant funding for projects that will promote job growth in the area. This could be used for water and wastewater system improvements if there is a possibility of attracting industries to use additional treatment capacity.

6.1b MDOT Transportation Alternatives Program (TAP)

TAP is a competitive grant program that uses federal transportation funds for specific activities that enhance the intermodal transportation system. It can be used for bike paths, pedestrian safety, or preservation of historical transportation facilities. Applications are accepted year-round and the amount of funding given varies from year to year.

6.1c Michigan Safe Routes to School (SRTS)

The Michigan SRTS program is administered by the environmental section of the Federal Highway Administration (FHWA) Office of Planning, Environment, and Realty. The goal of the program is to encourage children to walk or bike to school and to make it safe to do so. The Major Grant is available to build sidewalks, crosswalks, and other improvements that are needed to improve non-motorized transportation to schools. An in-depth planning and application process can take up to a year, and application deadlines are on-going.

6.1d Passport Grant

Passport grants are provided to local units to provide recreation facilities. The application process involves submitting an application to the DNR. The deadline is April 1st of each year. This could be used to fund trail expansion projects in the city.

6.1e Green Project Reserve (GPR) Grants

Grants can be received through SRF if the project qualifies as a green project. A green project can produce green infrastructure, improve water efficiency, improve energy efficiency, or be environmentally innovative. Some of the proposed projects for the water or wastewater systems could qualify.

6.2 Loans

6.2a Clean Water State Revolving Fund (CWSRF)

The CWSRF is a program to provide loans for wastewater projects. The loans are provided to municipalities at a low interest rate for 20 years. As an SRF loan, the acquisition process requires a preliminary engineering report (PER) and the project will include prevailing wages. Accepted projects are added to a Project Priority List (PPL). Projects are chosen from the list for funding. The deadline for submission is July 1st. The process can require additional design, so if this funding is desired, the process should be started as early as possible.

6.2b Drinking Water State Revolving Fund (DWSRF)

The DWSRF is a program just like CWSRF but for drinking water projects. The loan and application process is identical.

6.2c USDA Rural Development (USDA-RD)

The USDA-RD provides low interest loans to municipalities with up to a 40-year life. The process requires a PER, but does not require prevailing wage. For qualifying communities, a grant of up to 40% of the project cost can be received as well. The current USDA-RD loan interest rate is 2.125%.

6.3 Bonds

6.3a Special Assessment Bonds

Special assessment bonds are municipal bonds used to fund a development project. The bonds can be levied against the community that benefits from the project. The bonds can have a maturity range up to 20 years.

6.3b Revenue Bonds

A revenue bond is issued by the municipality and supported by revenue collected from the completion of the project. They can be used for funding if the project will produce specific revenue upon completion.

6.3c Contract Bonds

A contract bond is an agreement between a city and other authority to have the authority issued bonds for the city. An authority such as a county may be able to issue bonds at a lower interest rate than the city. These bonds can be paid back from many different sources.

7. *Appendix A – Reports*

West Side Lift Station Report

WWTF Report

8. *Appendix B – Maps*

Wastewater Treatment Facility Site Layout

Storm Sewer System IDs & Sizes

Wastewater System IDs & Sizes with Proposed Work

Wastewater System Years & Materials

Water System IDs & Sizes

Road Network Conditions

City of Pottersville
Sanitary Lift Station Review Sheet

Inspection Date: Thursday, January 7, 2021

Name: West Side Lift Station
 Year Built: 2013
 Location: End of Tim's View St.
 Type: Submersible Pump Station

Physical Characteristics

Wet Well

Type: Submersible Pump
 Material: Concrete
 Dia.: 8.0'
 Depth: 23.50'
 Inlet Pipe: 10-inch PVC
 Access Hatch: 36"x60"
 Vent: Yes
 Interior Coating: Yes
 Pipe Condition: Good
 Overall Condition: Good

Pumps

Brand: Flygt
 Location: Wet Well
 Number: 2
 Power: 480V, 3 Ph

	Pump 1	Pump 2	Pump 3
Rated Flow:			
TDH:			
Hp:			
Replaced/Rebuilt:			
Actual Flow:			
Run Hours:			

Site and Forcemain

Access Road: Yes
 Site Layout: Off-Road
 Forcemain Size: 8"
 Forcemain Type: Asbestos Cement/Ductile Iron
 Forcemain Length: 3,919'
 Discharge Point: WWTF

Electrical and Controls

Incoming Power: 480V, 3 Ph
 Backup Power: ATS and Generator Connection
 Over/Underground: Underground
 Phase Converter: None
 Pump Controller: MultiSmart
 Level Control: Pressure Transducer
 Backup Level Control: Floats
 Pump Alternator: Yes
 Flow Meter: No
 Panel Condition: Good

Valve Vault

Type: Circular Chamber
 Material: Concrete
 Diameter: 7.0'
 Discharge Angle: 180°
 Access Hatch: 36"x36"
 Interior Coating: None
 Sump Pump: Yes
 Isolation Valves: Plug
 Check Valves: Swing Check
 Bypass: 6" Camlock & Ball Valve
 Pipe Condition: Good

Other Equipment

Bioxide: No
 Desulfinator: No
 Mission System: Yes

Known Problems:

Planned Upgrades:

General Comments:

Cutting rings and mix valve added to station in 2020

City of Pottersville
POTW Review Sheet
Inspection Date: Thursday, January 7, 2021

Name: Wastewater Treatment Facility
 Year Built: 1979
 Location: 4175 E Vermontville Highway
 Type: Aerated Lagoon with Clarifier

Pump StationWet Well

Type: Influent Screen with Pump Intake
 Material: Concrete
 Dia.: 8'
 Depth: 20.50'
 Inlet Pipe: 16" Cast Iron
 Access Hatch: 24"x30" Hatch
 Vent: None
 Interior Coating: None
 Pipe Condition: Good
 Overall Condition: Good

Pumps

Brand: Flygt
 Location: Dry Pit
 Number: 2
 Power: 480V, 3 Ph

	Pump 1	Pump 2	Pump 3
Rated Flow:	1300 gpm	1300 gpm	
TDH:	74'	74'	
Hp:	34	34	
Rebuilt:			
Actual Flow:			
Run Hours:			

Site and Forcemain

Access Road: Gravel Road
 Site Layout: Off-road
 Forcemain Size: 10"
 Forcemain Type: Ductile Iron
 Forcemain Length: 650'
 Discharge Point: Aeration Cells

Electrical and Controls

Incoming Power: 480V, 3 Ph
 Backup Power: Permanent Generator with ATS
 Over/Underground: In Adjacent Building
 Phase Converter: None
 Pump Controller: MultiSmart
 Level Control: Pressure Transducer
 Backup Level Control: Floats
 Pump Alternator: Yes
 Flow Meter: Yes
 Panel Condition: Excellent

Valve Vault

Type: Separate
 Material: Steel
 Dia.: 9.5'
 Depth: 20.50'
 Access Hatch: 4.0' dia. Access tube
 Interior Coating: Paint
 Sump Pump: Yes
 Pipe Condition: Excellent
 Isolation Valves: Plug
 Check Valves: Swing
 Bypass: Yes, exterior manhole

Other Equipment

Bioxide: No
 Desulfinator: No
 Mission System: Yes
 Air-Release Valve: Yes
 Cleanout: Yes

Aeration Cell #1

Length:	190	feet
Width:	100	feet
Acreage:	0.4	acres
Volume:	14000	gallons
Depth:	9	feet
Liner Type:	Clay	
Inlet Pipe:	10"	
Bank Slope:	3.5:1	
Liner Condition:	Fair	
Overall Condition:	Good	

Valve Manhole #1 (Aeration Cell Influent)

Size:	6' Dia
Depth:	8'
Material:	Concrete
Equipment:	10" influent from pump station (2) 10" inf. to cells with plug valves 10" bypass with plug valve
Access:	30" manhole cover
Equip. Condition:	Fair
Struct. Condition:	Good

Valve Manhole #3 (Aeration Cell Effluent)

Size:	6' Dia
Depth:	8'
Material:	Concrete
Equipment:	10" bypass from valve MH #1 (2) 12" inf. w/ plug valves (2) 12" disch w. sluice gates
Access:	30" manhole cover
Equip. Condition:	Fair
Struct. Condition:	Good

Storage Cell #1

Length:	1000	feet
Width:	720	feet
Acreage:	16.5	acres
Volume:	1000000	gallons
Depth:	11	feet
Liner Type:	Clay	
Inlet Pipe:	12"	
Bank Slope:	3:1/4:1	
Liner Condition:	Fair	
Overall Condition:	Good	

Aeration Cell #2

Length:	190	feet
Width:	100	feet
Acreage:	0.4	acres
Volume:	14000	gallons
Depth:	9	feet
Liner Type:	Clay	
Inlet Pipe:	10"	
Bank Slope:	3.5:1	
Liner Condition:	Fair	
Overall Condition:	Good	

Valve Manhole #2 (Aeration Cell Transfer)

Size:	6' Dia
Depth:	8'
Material:	Concrete
Equipment:	10" plug valve for transfer from aeration cell #1 to #2
Access:	30" manhole cover
Equip. Condition:	Fair
Struct. Condition:	Good

Valve Manhole #3 (Aeration Cell Drain)

Size:	6' Dia
Depth:	8'
Material:	Concrete
Equipment:	(2) 6" drain with plug valve 12" overflow in 12" discharge to storage cell #2
Access:	30" manhole cover
Equip. Condition:	Fair
Struct. Condition:	Good

Storage Cell #2

Length:	800	feet
Width:	760	feet
Acreage:	14	acres
Volume:	850000	gallons
Depth:	11	feet
Liner Type:	Clay	
Inlet Pipe:	12"	
Bank Slope:	3:1/4:1	
Liner Condition:	Fair	
Overall Condition:	Good	

Clarifier

Size:	85'	Dia
Depth:	12'	SWD
Feed Location:	Center	
Weir Location:	Edge	
Sludge Collector:	Scraper	
Scum Hoppers:	2	
Sludge Discharge:	Sludge Lagoons	
Struct. Condition:	Good	
Equip. Condition:	Excellent	

Electrical and Controls

Incoming Power:	480V, 3 Ph	
Backup Power	Permanent Generator with ATS	
Phase Converter:	None	
Pump Controller:	MultiSmart	
Level Control:	Floats	
Pump Alternator:	Yes	
Flow Meter:	None	
Panel Condition:	Excellent	

Sludge Lagoon #1

Length:	250	feet
Width:	180	feet
Acreage:	1	acres
Volume:	45000	gallons
Depth:	16-18	feet
Liner Type:	Clay	
Inlet Pipe:	6"	
Bank Slope:	4:1	
Liner Condition:	Fair	
Overall Condition:	Good	

Sludge Inlet Manhole (From Clarifier to Sludge Lagoons)

Size:	6' Dia	
Depth:	8'	
Material:	Concrete	
Equipment:	(2) 6" effluent to sludge lagoons w/ sluice gates 6" influent from clarifier sludge pit	
Access:	30" manhole cover	
Equip. Condition:	Fair	
Struct. Condition:	Good	

Sludge Pumps

Brand:	Flygt		
Location:	Sludge Wet Well		
Power:	480V, 3 Ph		
	Pump 1	Pump 2	Pump 3
Rated Flow:	350 gpm	350 gpm	
TDH:	33'	33'	
Hp:	7.5	7.5	
Rebuilt:			
Run Hours:			

Wet Well

Material:	Concrete		
Size:	12'x10'		
Depth:	20.5'		
Access Hatch:	Grating		
Sump Pump:	No		
Bypass Connection:	No		
Isolation Valves:	Plug		
Check Valves:	Swing		

Sludge Lagoon #2

Length:	250	feet
Width:	180	feet
Acreage:	1	acres
Volume:	45000	gallons
Depth:	16-18	feet
Liner Type:	Clay	
Inlet Pipe:	6"	
Bank Slope:	4:1	
Liner Condition:	Fair	
Overall Condition:	Good	

Sludge Draw Manhole #1/#2 (From Sludge Lagoon #1/#2)

Size:	6' Dia	
Depth:	18'	
Material:	Concrete	
Equipment:	6" effluent to clarifier sludge pit (3) 6" influent with plug valves	
Access:	30" manhole cover	
Equip. Condition:	Fair	
Struct. Condition:	Good	

Storage Cell #3 (Abandoned)

Length:	550	feet
Width:	550	feet
Acreage:	6.9	acres
Volume:	200000	gallons
Depth:	5	feet
Liner Type:	Clay	
Inlet Pipe:	8"	
Bank Slope:	3:1	
Liner Condition:	Fair	
Overall Condition:	Good	

Transfer Manhole #1 (From Storage Cell #1)

Size:	6' Dia	
Depth:	8.5'	
Material:	Concrete	
Equipment:	14" in w/ plug valve	
	12" in w/ plug valve	
	14" out w/ sluice gate	
	12" out w/ sluice gate	
Access:	30" manhole cover	
Equip. Condition:	Fair	
Struct. Condition:	Good	

Transfer Manhole #3 (Abandoned)

Size:	6' dia	
Depth:	12.5'	
Material:	Concrete	
Equipment:	12" effluent to abandoned P.S.	
	(3) 12" inf from storage cell #4	
	w/ plug valves	
Access:	30" manhole cover	
Equip. Condition:	Fair	
Struct. Condition:	Fair	

Building 1 (Service Building)

Size:	40'x32'	
Height:	14	feet
Type:	Block on Slab	
Equipment:	Alum Bulk Storage Tank	
	Alum/Chlorine Day Tank	
	Alum/Chlorine Feed Pumps	
	Generator	
	Control Panels	
Struct. Condition:	Good	
Equip. Condition:	Good	

Storage Cell #4 (Abandoned)

Length:	550	feet
Width:	550	feet
Acreage:	6.9	acres
Volume:	200000	gallons
Depth:	5	feet
Liner Type:	Clay	
Inlet Pipe:	8"	
Bank Slope:	3:1	
Liner Condition:	Fair	
Overall Condition:	Good	

Transfer MH #2 (From Storage Cell #2)

Size:	6' Dia	
Depth:	8.5'	
Material:	Concrete	
Equipment:	14" in w/ plug valve	
	12" in w/ plug valve	
	14" out w/ sluice gate	
Access:	30" manhole cover	
Equip. Condition:	Fair	
Struct. Condition:	Good	

Transfer Manhole #3 (Abandoned)

Size:	5'x6'	
Depth:	6'	
Material:	Concrete	
Equipment:	Stop Plate	
Access:	Grating	
Equip. Condition:	Fair	
Struct. Condition:	Fair	

Building 2

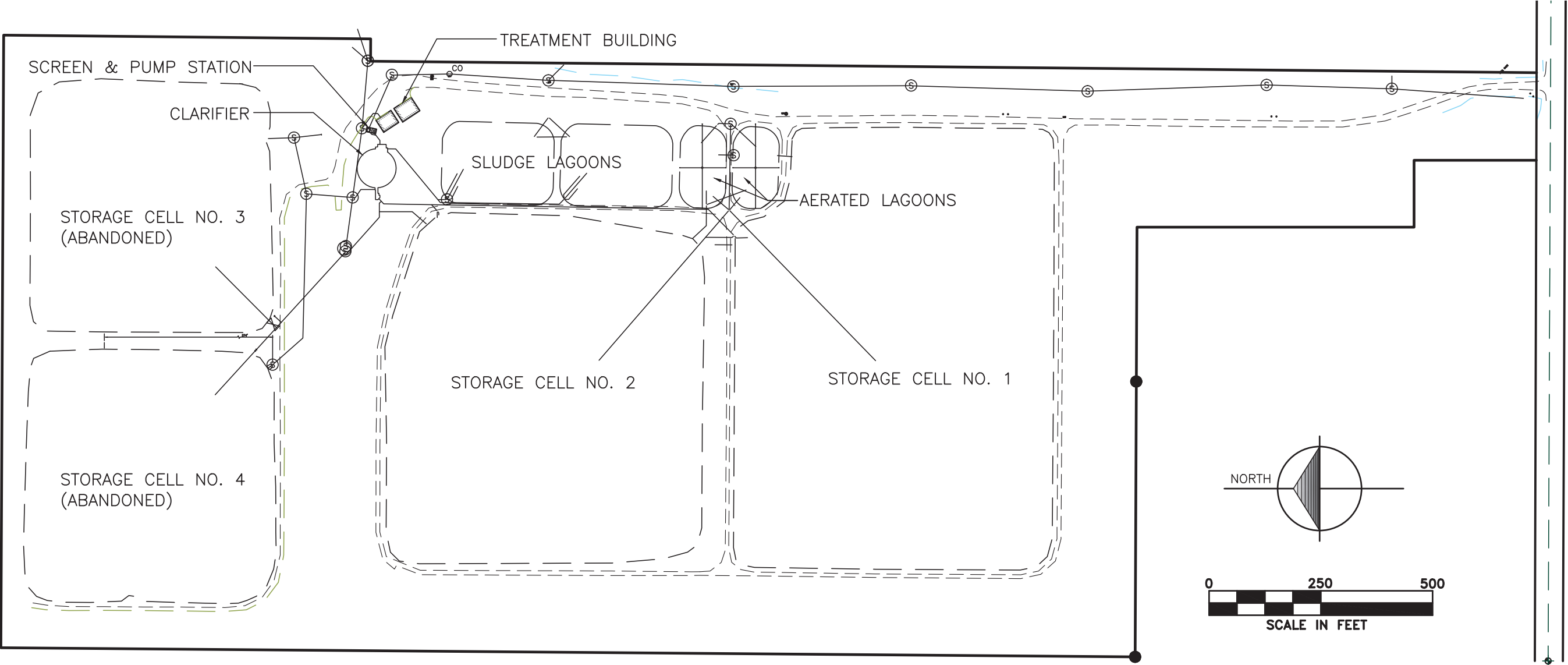
Size:	36'x46'	
Height:	14	feet
Type:	Block on Slab	
Equipment:	None	
Struct. Condition:	Good	
Equip. Condition:	Good	

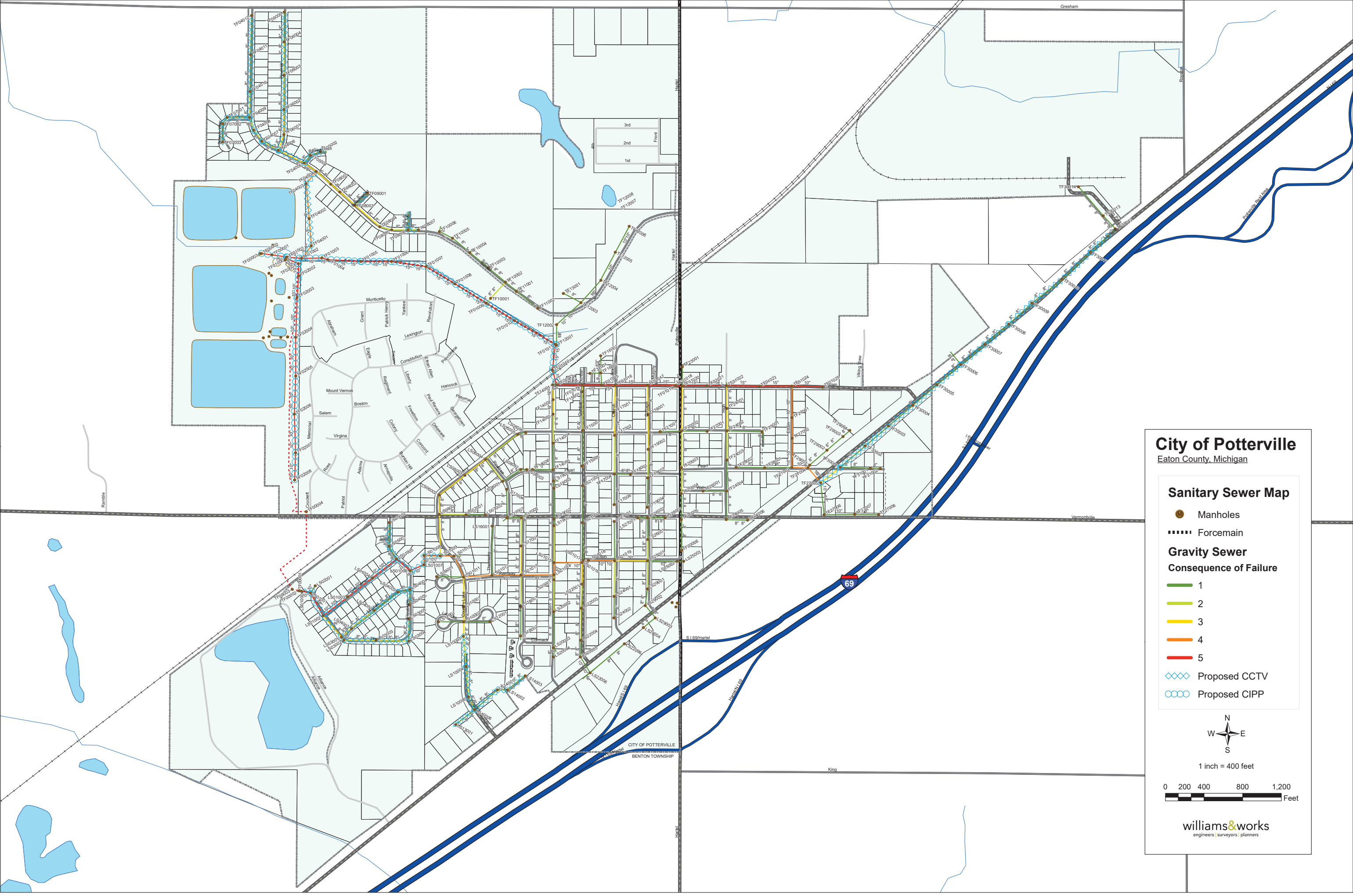
Known Problems:

Planned Upgrades:

General Comments:

CITY OF POTTERVILLE
2020 CAPITAL IMPROVEMENT PLAN
WASTEWATER TREATMENT FACILITY SITE LAYOUT





City of Potterville
Eaton County, Michigan

Sanitary Sewer Map

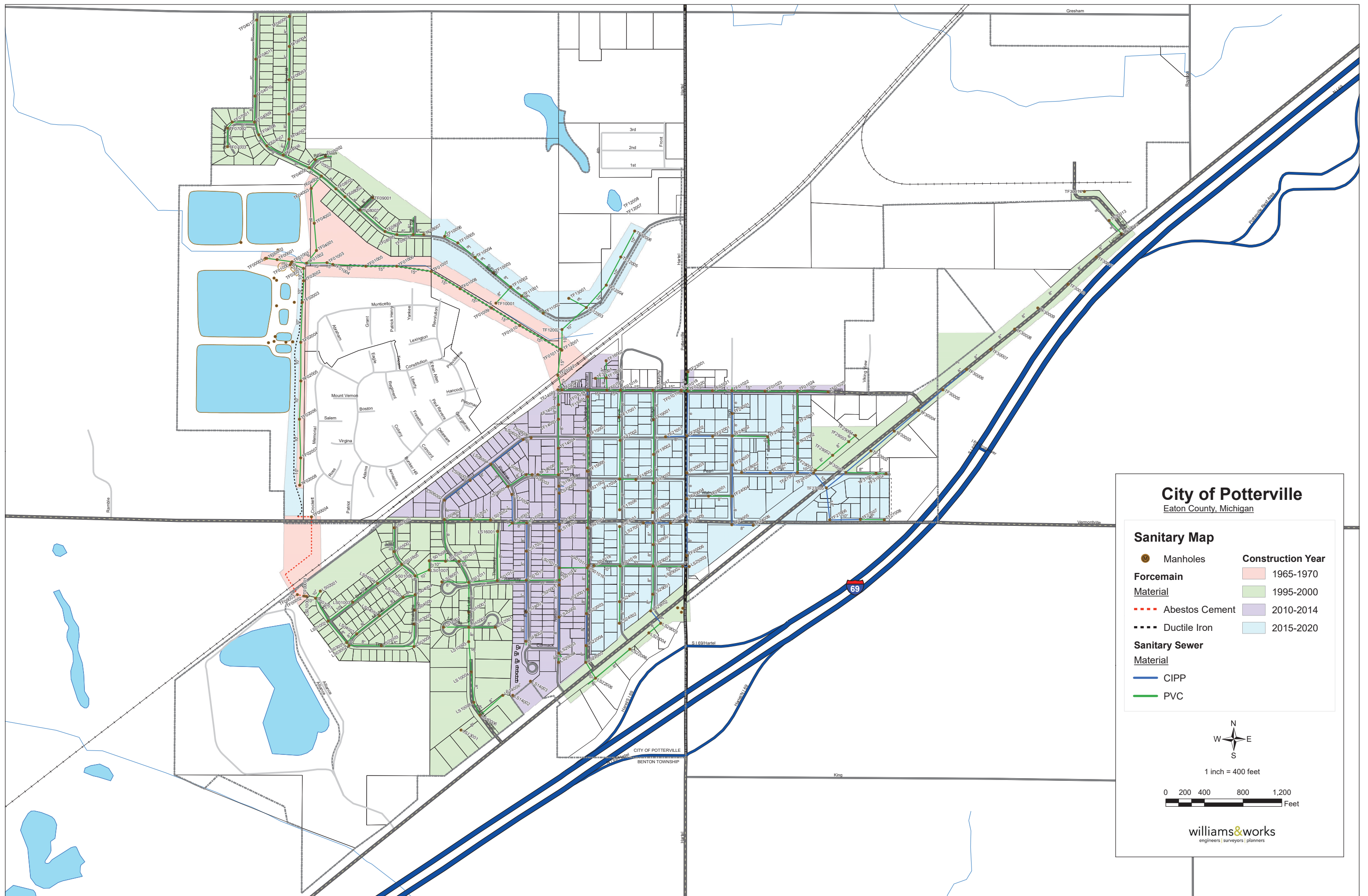
- Manholes
- Forcemain
- Gravity Sewer**
- Consequence of Failure**
 - 1
 - 2
 - 3
 - 4
 - 5
- Proposed CCTV
- Proposed CIPP

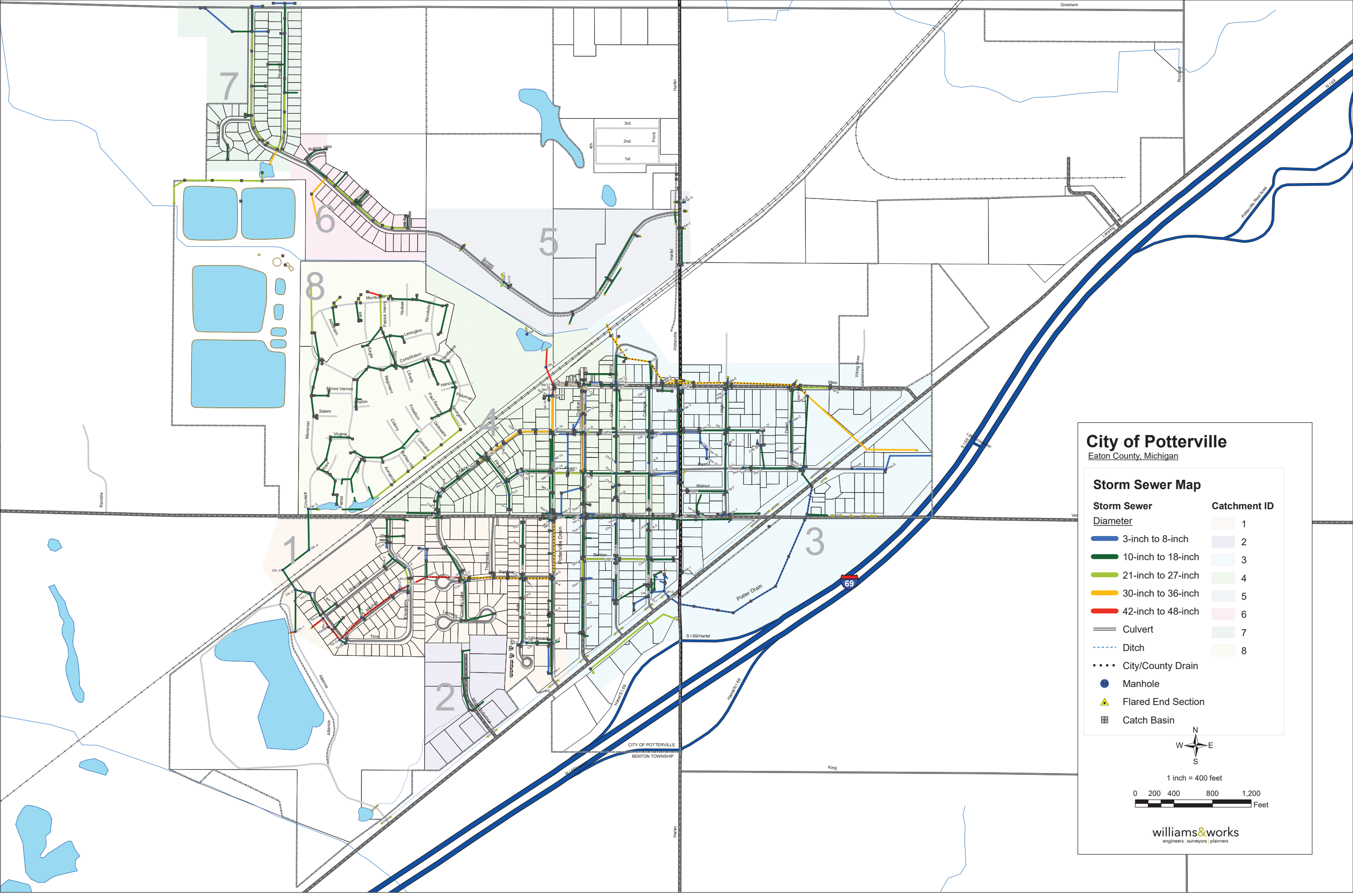


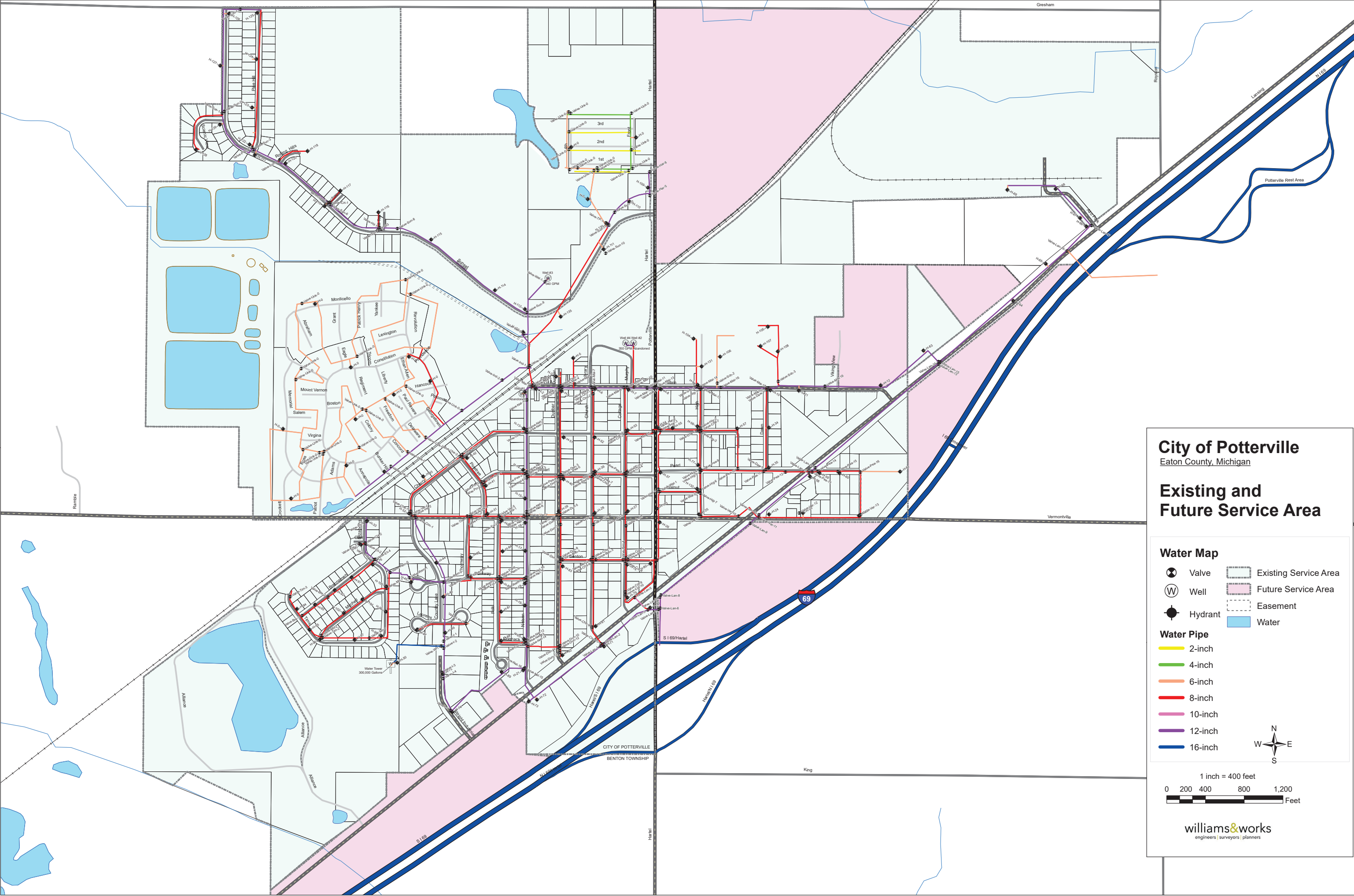
1 inch = 400 feet

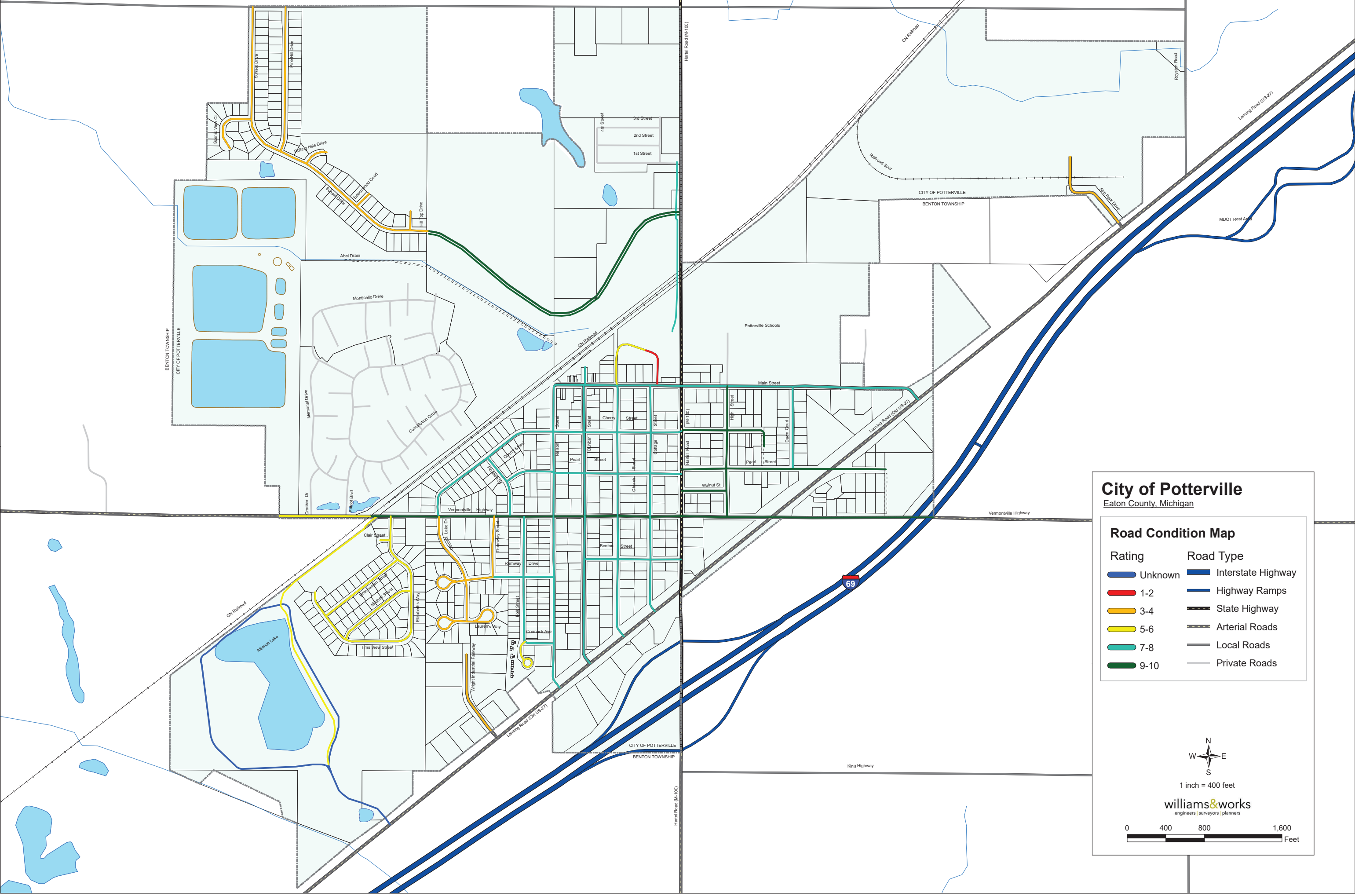


williams&works
engineers | surveyors | planners









City of Potterville

Eaton County, Michigan

Road Condition Map

Rating	Road Type
Unknown	Interstate Highway
1-2	Highway Ramps
3-4	State Highway
5-6	Arterial Roads
7-8	Local Roads
9-10	Private Roads

N

W

E

S

1 inch = 400 feet

engineers | surveyors | planners

0

400

800

1,600

Feet