



City Council Utilities Committee
Wednesday, August 3, 2022 – 5:00 p.m.

Huron City Hall – Main Conference Room
417 Main Street
Huron, OH 44839

MEETING AGENDA

- I. Call to Order**
- II. Old Business**
- III. New Business**
 - A. Review of Poggemeyer study regarding installation of a secondary intake at the Water Treatment Plant
 - B. Review of OHM's 2022 Pavement Condition Report
- IV. Other Matters**
- V. Adjournment**



**EMERGENCY RAW WATER
INTAKE PROJECT PLAN
CITY OF HURON
20225811.001A**

JUNE 2022

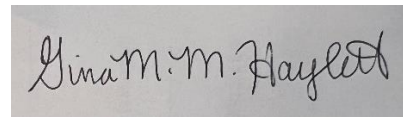
ONLY THE CLIENT OR ITS DESIGNATED REPRESENTATIVES MAY USE THIS DOCUMENT AND ONLY FOR THE SPECIFIC PROJECT FOR WHICH THIS REPORT WAS PREPARED.

A Report Prepared for:

Mr. Jason Gibboney
Water Superintendent
City of Huron
500 Cleveland Road West
10 Waterworks Drive
Huron, Ohio 44839

**EMERGENCY RAW WATER
INTAKE PROJECT PLAN
CITY OF HURON
20225811.001A**

Prepared by:



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Project No: 20225811.001A

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1 INTRODUCTION

The City of Huron is located in Erie County, Ohio, and owns and operates the Huron Filtration Plant, a 3.4 MGD surface water treatment plant (WTP) which is in the process of being upgraded to 5.8 MGD. The water filtration plant has one 36-inch raw water intake approximately 2,200 feet from the shore in Lake Erie.

During the winter months when temperatures fall rapidly and there is open water over the intake, frazil ice can form and plug the City's intake. Frazil ice is a problem that occurs when ice forms a collection of randomly oriented ice crystals that gather in the water and are drawn into the intake plugging the inlet and stopping water flow to the WTP. Frazil ice is a problem because it can build up on equipment and pipes very quickly. The City of Huron's water intake in Lake Erie, and other water intakes in the Great Lakes, frequently see problems with frazil ice buildup that can cause a myriad of issues from minor operational problems to stopping the water flow into the treatment plant.

The City has tried to resolve this serious issue using many options to combat the buildup of frazil ice on their raw water intake to no avail. Attempts were made to use a heater to warm the water to dissolve the frazil ice and bubbler systems have been tried and shown to be ineffective. A solution is required to ensure the City can continuously provide a reliable clean water supply. The only solutions that have been known to work are putting intakes in deeper water or moving water.

2 BACKGROUND

2.1 LOCATION

The City of Huron, Ohio is located in Erie County along the shore of Lake Erie (Figure 1). The total land area is 4.84 square miles.

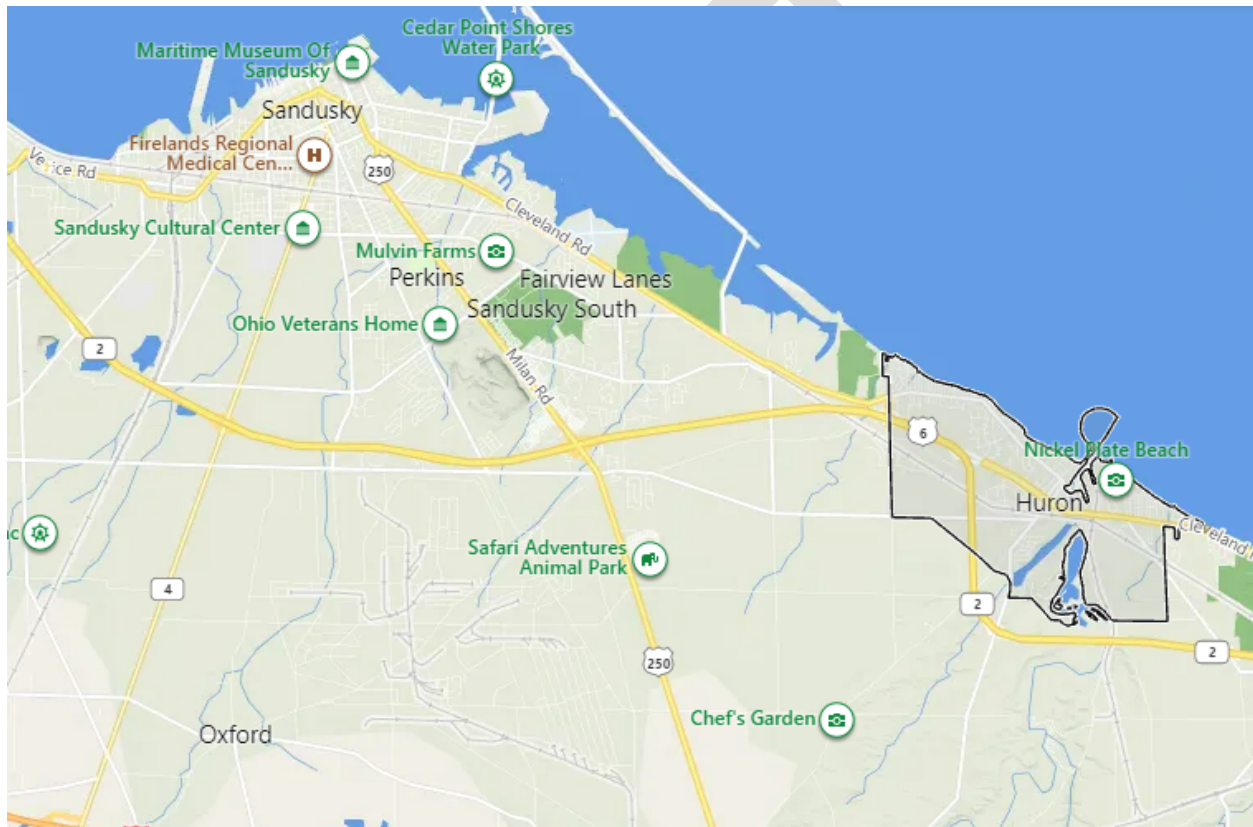


Figure 1: City Location Map

2.2 DEMOGRAPHICS

The population was 6,922 in the 2020 census, a 3.2 percent decline from a population of 7,149 during the 2010 census. In the 2019 Population Estimates for Cities, Villages, and Townships document published in May 2020 by the Ohio Department of Development, the City of Huron was estimated to see a -0.4 percent average annual rate of change from 2010.

Erie County overall also saw a decline in population by 1.9 percent from the 2010 to 2020 census from 77,079 to 75,622, respectively. This decline was less than the Ohio Department of Development population projections for Erie County, published in April 2018, that estimated a decline in population of 5.4 percent. The Ohio Department of Development estimates the population will continue to decline in Erie County over the planning period.

While a decline in population may result in less water customers, some of the decline is offset by the large volume of tourists that visit the area each year.

It is difficult to predict with certainty flows to the WTP from population alone due to the population volatility in the area, with large fluctuations in tourism and large water customers. Additionally, the City is connected to the Erie County Water District that could add additional customers to the City of Huron.

Additional demographics for the City of Huron can be found in the table below:

Table 1: City of Huron Demographics

Number of Households	3,027
Median household income	\$61,833
Population per square mile	1,478.1

2.3 EXISTING FACILITIES

The City of Huron owns and operates its own WTP that was built in 1957. The Huron Filtration Plant is located at 10 Waterworks Drive in Huron, Ohio 44839. A location map of the Water Filtration Plant can be found in Figure 2.

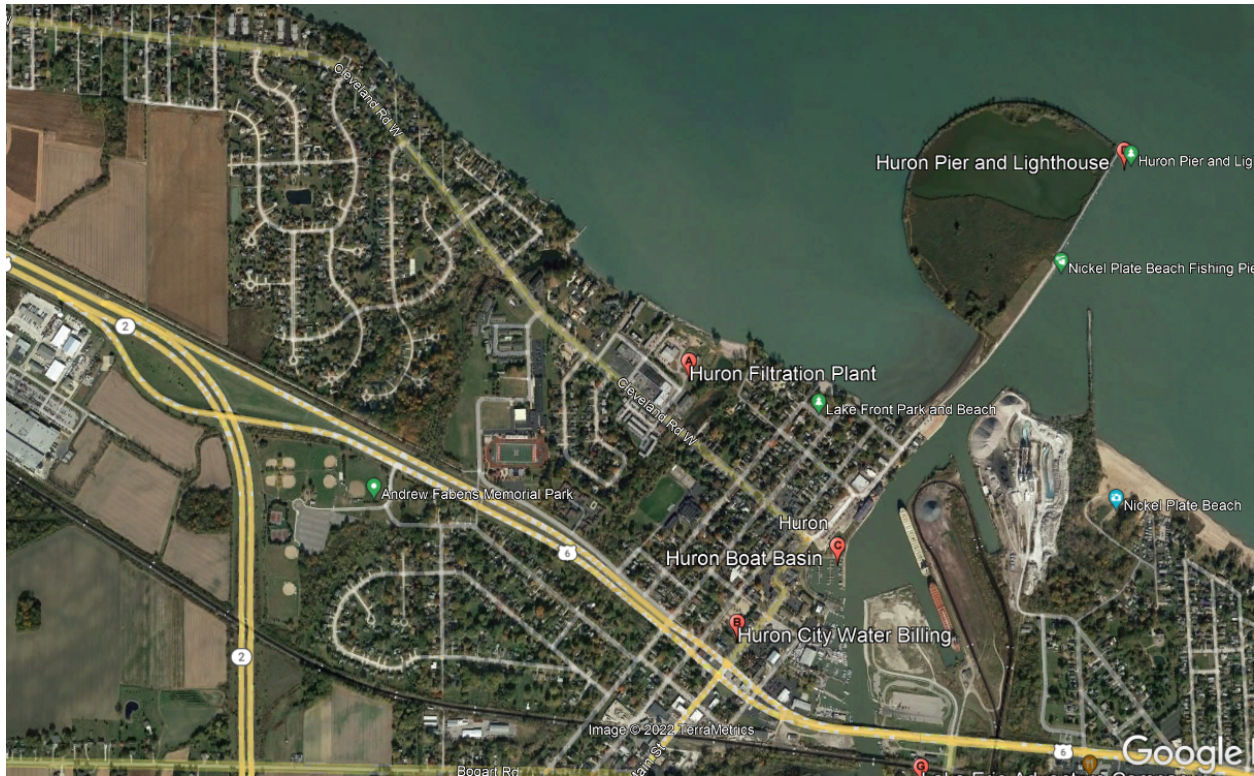


Figure 2: Site Location Map

The facility is a 3.4 MGD traditional surface water treatment plant, utilizing coagulation, sedimentation, flocculation, and filtration. The primary raw water intake is located approximately 2,200 feet from the shore of Lake Erie. A 36" diameter pipe brings water from the intake crib through a screen to a raw water wet well located on shore. Sodium permanganate is fed at the intake before the raw water enters the wet well. From the wet well, low service pumps convey the raw water into the plant for treatment.

Inside the plant, raw water enters a rapid mix basin where ACH and PAC are added. The flow is then split into 5 treatment trains consisting of a flocculation basin, a flocculation settling basin, and a dual media filter. From the settling basins, water flows to the filters. The filtered effluent is then chlorinated and fluorinated before flowing to the clearwells.

The WTP has three underground concrete clearwells, each built during different plant upgrades. The clearwells are normally operated in series providing the longest flow path through the clearwells. Each of the clearwells can be isolated and removed from service for maintenance if needed. Clearwells #1, 2, and 3 have a capacity of 72,320, 67,170, and 265,840 gallons, respectively.

3 NEED FOR THE PROJECT

3.1 COMPLIANCE ISSUES

There are no compliance issues associated with this project.

3.2 EXISTING WATER INTAKE

The existing facility currently has one raw water intake from Lake Erie, as shown in Figure 3. The primary raw water intake is located 2,200 feet from the shore of Lake Erie. A 36" diameter line brings water from the intake crib through a screen to a raw water wet well located on shore.

City of Huron Water Intake



Figure 3: Existing Raw Water Intake

With most water intakes in Lake Erie, there is a risk of frazil ice buildup in the existing raw water intake. Frazil ice is a collection of loose, randomly oriented ice crystals aggregate. Contrary to regular ice, frazil ice does not float and will adhere to nearby objects in the water. The City of Huron has had problems nearly every year with frazil ice buildup, with varying degrees of impact. While some years the impact has been minimal, other years the plant has been close to running out of water reserves before they could clear the blockage to the intake.

The City has tried several options to attempt to solve the issue including adding an air bubbling system, installing a heater at the intake, and other options without success.

A solution is required to ensure uninterrupted service for the water system.

DRAFT

4 ANALYSIS OF ALTERNATIVES

4.1 IDENTIFICATION OF ALTERNATIVES

4.1.1 No Action

A “No Action” alternative was considered, but without the project the City will continue to see frazil ice buildup on the existing intake in Lake Erie. This could result in the City running out of treated water to provide to customers. For these reasons, “No Action” was not considered a viable alternative and is not considered further. The City has also tried to use less expensive alternatives that have not proven effective in preventing ice blockages in the Lake Erie intake. We have also ruled out these alternatives for modifying the existing lake intake due to the limited or minimal improvement experienced by the City and others around Lake Erie with improvements to the intake.

4.1.2 Regional Alternative

Through the Erie County Water and Sewer District, the City of Huron is connected to Vermillion and Sandusky. Typically, Huron is pushing water out into the system, and it is not documented if there would be enough pressure for Huron to receive water from Sandusky or Vermillion. Sandusky and Vermillion both receive water from Lake Erie and have the potential to also be impacted by frazil ice. Due to this, this alternative is not considered further.

Another alternative would be to connect to a plant that uses a groundwater source. There are no municipalities within a reasonable distance from Huron that use groundwater as a source for drinking water, so this is not a viable alternative and is not considered further.

4.1.3 Secondary Raw Water Intake

An emergency secondary raw water intake could be placed within the Huron River to allow the City to draw water from this intake in the event the primary water intake is impacted by frazil ice. The Huron River empties into Lake Erie near Main Street and Wall Street. A secondary emergency raw water intake is proposed to be installed to withdraw water from the Huron River. One option for such an intake is near the Huron Boat Basin Marina within the West Turning Basin Harbor of the Huron River. A 36-inch intake line would withdraw the water from the Huron River via a pump station in the proposed location

shown in Figure 4. Water would be conveyed to the water treatment plant via a 20-inch water line through a residential district. The pump station would consist of a 30-foot deep, 12-foot diameter, concrete wet well with two submersible pumps.

The City could also consider withdrawal from the river in an alternative location. The alternative intake location is further down river at the small City owned park on the Huron River. The alternative emergency raw water intake site is a more expensive option and harder to construct. The site is very small for a pump station and generator. The excavation required for the pump station would use up most of the site. The length of forced main would also be longer and require additional pipe for construction. This potential site could work, but it would likely render the park difficult to use for other activity. There would still be a 36-inch intake line that would draw water from the Huron River to a pump station to be located on the park property. Water would be conveyed to the water treatment plant via a 20-inch water line through a residential area and along Main Street. The pump station would be the same as described above. This alternative location for the intake is both more expensive and less desirable than the previously mentioned site as a more difficult site to construct the intake and pump station on. The availability of this site to be used for a park would also be greatly diminished once the intake and pump station have been constructed.

4.1.4 Extend Raw Waterline to Deeper Water

Extension of the existing raw waterline further into the lake where the water is deeper is another option for reducing the occurrences of occlusion or eliminating them. The additional length of waterline required to get to water deep enough to remain below the frazil ice would be prohibitive. The western basin is shallow and the deepest parts are close to the middle of the lake creating a gentle bottom slope. To obtain enough depth for a new intake would require a significant length of raw watermain making the extension of the raw waterline cost prohibitive.

5 SELECTED ALTERNATIVE

5.1 RECOMMENDED ALTERNATIVE

The selected alternative is to install an emergency secondary raw water intake that would allow the plant to have an additional option should there be a blockage at their primary intake from Lake Erie. The proposed location of the emergency secondary raw water intake is in the West Turning Basin Harbor of the Huron River.

5.2 PROJECT SCHEDULE

Table 3-1: Target Project Schedule

Item	Target Completion Date
Planning	June 2022
Design	June 2023
OEPA Approval	October 2023
Construction Begins	December 2023
Complete Construction	December 2024

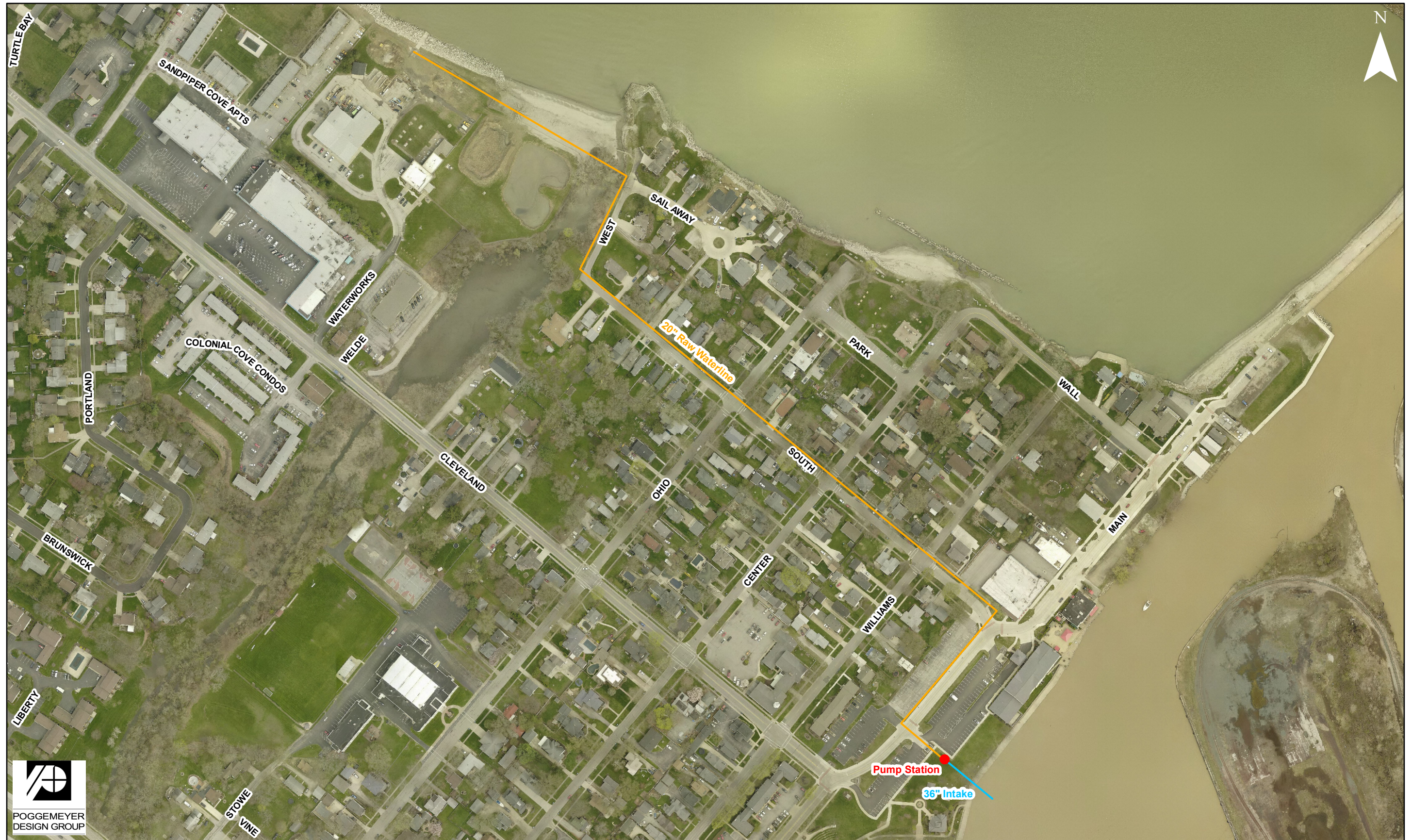
5.3 ENGINEER'S OPINION OF PROBABLE COST

The engineer's opinion of probable cost is \$2,906,700 with the pump station being \$670,000 of the total project cost. The expected useful life of the waterline is 50 years for the raw waterline and 30 years for the pump station. Complete preliminary engineering cost opinions of the raw water intake with piping to the water filtration plant and pump station are included in Appendix A.

5.4 ENVIRONMENTAL CONSIDERATIONS

The proposed water line will be installed primarily within previously disturbed right-of-way locations. Soil erosion and sedimentation control measures will be implemented as required by the Ohio EPA. Permitting for the new intake in the river will also be required. Construction of the new pump station

Huron WTP Intake, Pump Station, and Raw Waterline



0 250 500 1,000 Feet

Figure 4 - Proposed Emergency Raw Water Intake

will also require space at the park. An effort should be made to make this building fit with the existing structures.

5.5 FUNDING

HURON, OHIO COMMUNITY INFORMATION

Demographic Information	City of Huron	Erie County	State of Ohio
2010 Population:	7,243	77,454	11,512,431
2010 # Households:	3,591	37,808	5,107,273
2010 MHI:	\$59,766	\$46,593	\$47,358
2010 % LMI:	28.09%	37.4%	
2020 Population:	6,922	75,622	11,799,448
2020 # Households:	3,027	31,319	4,717,226
2020 MHI:	\$61,833	\$58,408	\$58,116
2011-2015 % LMI:	39.48%	35.83%	

FINANCING ELIGIBILITY SUMMARY FOR ENVIRONMENTAL PROJECTS (WATER AND WASTEWATER PROJECTS)

(NOTE: this information is not to be considered inclusive of all potential financing, but merely is a starting point for workshop or planning discussions)

US Department of Agriculture/Rural Development (USDA/RD) (Formerly FmHA): Community qualifies for USDA/RD loan assistance at the Market lending rate for water and wastewater projects, which through 06/30/2022 is 2.5% fixed rate for a term of up to 40 years, depending on the project needs and the useful life of the infrastructure constructed.

Applications may be submitted at any time during the year. Questions should be directed to the State office in Columbus or the local office in Massillon, Ohio, which covers communities in Erie County. That office is located at 2650 Richville Drive SE, Suite 102, Massillon, Ohio 44646. Contact person: John Miller, Phone 330-830-7700 ext. 4 or john.miller@oh.usda.gov. Office Hours are 8:00AM – 4:30PM Monday through Friday.

OWDA: Current Market rate is 3.48% for 20 years and 3.62% for 30 years (rate applicable through 06/30/2022). Loans are available for water/sewer projects only on a 5 - 30 year basis. Planning loans for 5 years are available at the same rate. Community cannot pay off planning or construction loans early, without penalty. However, OWDA recently has ruled that all projects must pay a percentage of the planning loan back annually, starting one year from the date of loan inception vs. the historic payment pattern with a balloon payment due at the end of the 5-year planning loan period.

There are discounted rates for communities who qualify based on distressed economic criteria, findings and orders, and previous OWDA loan recipients.

Regular construction/planning applications are received monthly throughout the calendar year. Applications are submitted to OWDA and are reviewed monthly. Contact Ken Heigel at OWDA for more information and details.

Ohio Public Works Commission (OPWC or Issue 2): The next round of applications will be due to Erie County September 9, 2022, with funding available after July 1, 2023. Only infrastructure projects (i.e., water, sewer, roads, bridges, culverts, etc.) can be funded through this program.

Loans, grants, and credit enhancement (interest rebates) are available for communities in Ohio. Interest rates on loans vary throughout the 19 OPWC Districts in Ohio. Erie County is located in OPWC District 5 and that District's rate is currently 0% for up to 30 years or the useful life of the project infrastructure.

Applications for new/expansion projects do not rate as well as repair/replacement or upgrading of infrastructure. Any infrastructure projects that would benefit the community by job creation/retention would rank higher on the District's ranking sheet. OPWC funds can also be used to fund infrastructure to industrial park sites.

Ohio EPA: Loan funds are available for water and wastewater projects, as well as combined sewer overflow (CSO) projects. Water projects for Huron would qualify for Small System Construction Loan at 1.73% for 20 years and 1.82% for 30 years (rate applicable through 06/30/2022). Therefore, it is important that projects be nominated and on the OEPA list of intended projects. Water projects are nominated annually on March 1 and Wastewater annually on August 1 for the next program cycle funding

Contact Michelle Hister at (419) 352-7537 for additional information and assistance.

Small Communities Environmental Infrastructure Group (SCEIG): This group is an association of state, federal, local, educational and service agencies. The goal of the group is to assist small communities in identifying the most appropriate resources to help the communities resolve problems associated with environmental infrastructure. The group will address the needs of specific communities if a member agency feels that a project cannot be funded without a coordinated effort. Community must present a profile/information sheet for review and is invited to make a presentation to the SCEIG. The SCEIG meets monthly on an appointment basis. The project will be evaluated and the SCEIG will make funding recommendations to the community. The group will continue to work with the community to obtain financial assistance, as available.

6 CONCLUSION

Frazil ice is a real and significant problem for water treatment plants in the western basin of Lake Erie. The western end of the lake is shallow enough that frazil ice is deep enough in the water column to be drawn into the intake and raw waterline causing a blockage in the flow of water to the treatment plant.

There are not many viable solutions to this problem. The most common solutions include moving the intake to deeper water, providing a temporary alternative intake location that may be less susceptible to the effects of frazil ice, or supplying heat or energy at the intake that could warm the water temperature at the intake.

Constructing a new emergency raw water intake to the Huron River at the Boat Basin provides a source of water that is flowing and able to allow flowing water into the pump station and raw waterline when the normal intake is plugged. This also provides a source of water to backwash the regularly used intake when it is plugged. This option provides the lowest cost option for the City.

APPENDIX A
Engineer's Opinion of Probable Cost

CITY OF HURON
ENGINEERS OPINION OF PROBABLE PROJECT COSTS
EMERGENCY RAW WATER INTAKE
 July 8, 2022

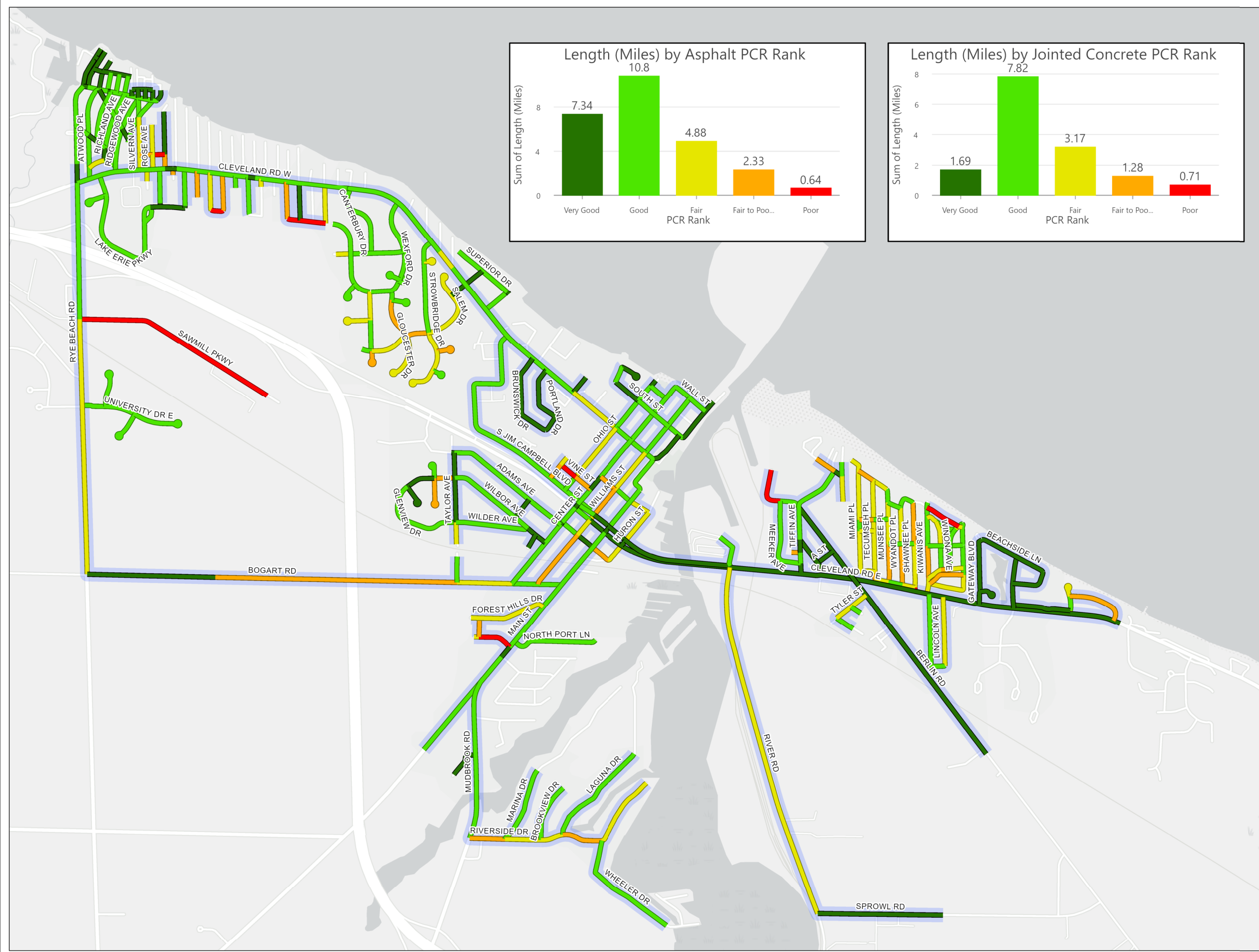
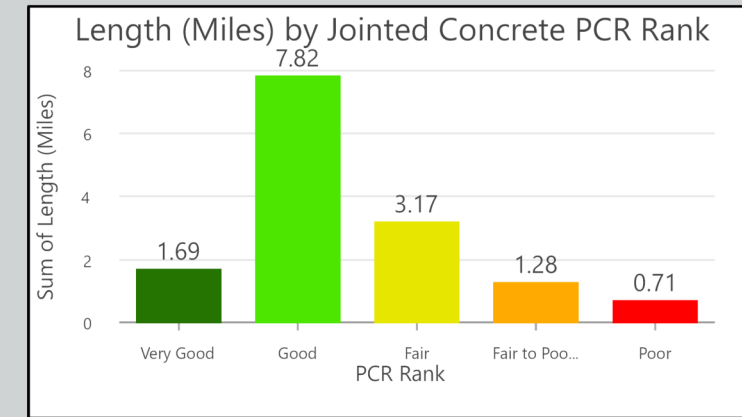
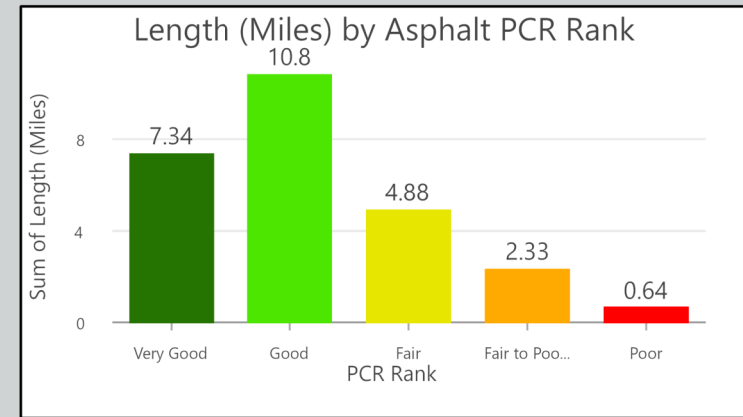
NO.	ITEM	QTY	UNITS	UNIT COST	TOTAL
Huron Raw Waterline and PS					
1	20" Waterline and Fittings	2,900	LF	\$250	\$725,000
2	36" Intake Line	300	LF	\$950	\$285,000
3	Screen Intake Structure	1	EA	\$200,000	\$200,000
4	Raw Water Pump Station w/ Standby Power	1	EA	\$765,000	\$765,000
5	Connect to Shorewell	1	EA	\$20,000	\$20,000
6	Storm Sewer Repair	250	LF	\$50	\$12,500
7	Pavement Repair - Roads	1,800	SYD	\$125	\$225,000
8	Pavement Repair - Drives	350	SYD	\$100	\$35,000
9	Traffic Control	1	LS	\$7,700	\$7,700
10	Restoration	1	LS	\$35,000	\$35,000
11	Preconstruction Video	1	LS	\$4,500	\$4,500
12	Bonds, Mobilization, and Insurance	1	LS	\$45,000	\$45,000
Construction Subtotal					\$2,359,700
Contingencies 10%					\$236,000
Subtotal Opinion of Construction Costs					\$2,595,700
Project Costs 18% (Engineering, Legal, Permits)					\$425,000
TOTAL OPINION OF PROJECT COSTS					\$3,020,700

The estimated useful life of the waterlines is fifty (50) years.

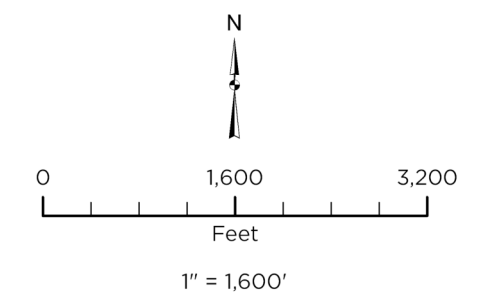
Thomas J Borck, P.E.

NOTE: This estimate does not include interest during construction, finance fees, bond counsel, assessment fees, bond insurance, land costs, land acquisition fees, or other miscellaneous expenses which can add up to 5% to 10% of the total cost once actual financing sources are finalized.

Pavement Condition
Ratings (PCR)
2022



- █ Very Good (PCR 90-100)
- █ Good (PCR 75-90)
- █ Fair (PCR 65-75)
- █ Fair to Poor (PCR 55-65)
- █ Poor (PCR 40-55)
- █ Very Poor (PCR 0-40)
- Highlight Denotes Asphalt
- No Highlight Denotes Jointed Concrete



Source: Data provided by Erie County, The City of Huron, and OHM Advisors. OHM Advisors does not warrant the accuracy of the data and/or the map. This document is intended to depict the approximate spatial location of the mapped features within the Community and all use is strictly at the user's own risk.

Coordinate System: NAD 1983 2011 StatePlane Ohio North FIPS 3401 Fr US

Map Published: May 24, 2022

