Drinking Water State Revolving Fund (DWSRF) Project Plan

Barton Pump Station Valve Improvement Project

City of Ann Arbor

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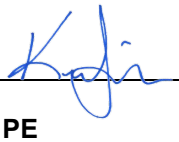
Prepared by  (signature)

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Executive Summary

The City of Ann Arbor (City) submits this final Project Plan to the Water Infrastructure Financing Section, Finance Division, Michigan Department of Environment, Great Lakes, and Energy (EGLE) to be ranked on the State's annual Project Priority List for obtaining low-interest loans from the State Revolving Fund. The City requests a Drinking Water State Revolving Fund (DWSRF) loan to finance the replacement of valves and piping at the Barton Raw Water Pump Station (Barton Pump Station) and installation of air relief valves (ARVs) on the City's raw water transmission mains that deliver source water from this pump station to the City's Water Treatment Plant (WTP).

Stantec Consulting Michigan Inc. (Stantec) has prepared this document in accordance with EGLE project plan guidance. Major elements of the Project Plan include a delineation of the project study area, identifying and evaluating improvement alternatives, presenting design requirements and construction schedules, and performing environmental impact reviews associated with implementing the selected alternative. Details concerning the project need, analysis methodology, and results are presented in this document. Based on the feasibility and environmental evaluations presented in this Project Plan, the selected alternative will replace valves and piping that are critical to the safe and reliable long-term operation of the City's raw source water supply infrastructure.

The Engineer's Opinion of Probable Construction Cost (EOPCC) prepared by Stantec for the proposed DWSRF project is approximately $4,582,705. User costs for valve improvement project construction were developed based on this EOPCC. Using a loan interest rate of 1.875% over a 20-year period, the annual loan repayment for the Barton Pump Station and raw water pipeline improvements is approximately $276,873. It is assumed that these costs will be distributed among all water customers within the City's service area, resulting in an increase of approximately 75 cents per quarter for an average residential user.

The opportunity for public participation began on April 29, 2021 with a public notice advertisement in the Washtenaw County Legal News and a City Press Release. The draft project plan was made available for review by interested persons at the Water Treatment Plant beginning on April 30, 2021 and concluding with a Zoom virtual public hearing on Thursday June 3, 2021. A description of public participation with minutes and comments as received from the public hearing is included in **Appendix E**.

Abbreviations

AMP	Asset Management Plan
ACM	Asbestos Containing Materials
CI	Cast Iron
City	City of Ann Arbor
DWSRF	Drinking Water State Revolving Fund
EGLE	Michigan Department of Environment, Great Lakes, and Energy
EOPCC	Engineer's Opinion of Probable Construction Cost
EPA	US Environmental Protection Agency
gpd	gallons per day
ICI	Industrial, Commercial, Institutional
MNFI	Michigan Natural Features Inventory
mgd	million gallons per day
MDOT	Michigan Department of Transportation
MIOSHA	Michigan Occupational Safety and Health Administration
NNL	National Natural Landmarks
O&M	Operation and Maintenance
OM&R	Operation, Maintenance and Replacement
OSHA	US Occupational Safety and Health Administration
RCP	Reinforced Concrete Pipe
PCCP	Pre-stressed Concrete Cylinder Pipe
RCP	Reinforced Concrete Pipe

SEMCOG	Southeast Michigan Council of Governments
SHPO	State Historic Preservation Office
Stantec	Stantec Consulting Michigan Inc.
THPO	Tribal Historic Preservation Office
TPW	Total Present Worth
USFWS	United States Fish and Wildlife Service
WTP	Water Treatment Plant

1.0 PROJECT BACKGROUND

The City of Ann Arbor (City) intends to apply for a Drinking Water State Revolving Fund (DWSRF) low-interest rate loan from the Water Infrastructure Financing Section, Finance Division, Michigan Department of Environment, Great Lakes, and Energy (EGLE) to replace aging valves and piping at the Barton Raw Water Pump Station (Barton Pump Station) and install air relief valves (ARVs) on the raw water transmission mains that convey source water withdrawn from Barton Pond to the City's Water Treatment Plant (WTP). The City has retained Stantec Consulting Michigan Inc. (Stantec) to prepare a DWSRF Project Plan in accordance with current EGLE guidance. This Project Plan will identify the project need, evaluate facility improvement alternatives, define a selected alternative, review potential environmental impacts, and solicit input from the public on the planned project.

1.1 DELINEATION OF STUDY AREA

The Barton Pump Station Valve Improvement Project is located primarily within the existing Barton Pump Station building and adjacent site grounds. Locations for replacement and installation of raw water pipeline ARVs are also included in this project. The study area for this project encompasses three distinct locations that are generally identified in **Figure 1 – Study Area** of **Appendix A**. Additional information related to the City's water service area is presented within in this section.

The City of Ann Arbor was founded in 1824 with the City Charter adopted in 1851. The City is located in Washtenaw County, Michigan. The City consists of approximately 27.7 square miles bounded to the north by Michigan State Route 14, to the west by Wagner Road, to the south by Interstate 94, and US Route 23 to the east. The City is a regional supplier of water to portions of Ann Arbor Charter Township and Scio Township, which operate and maintain their own water distribution systems.

The City operates 156 parks consisting of approximately 2,056 acres of land which includes 4 public pools, 2 golf courses, a regulation-size ice rink and outdoor seasonal ice rink, 2 canoe liveries, and an urban skate park. The City offers 18 miles of bicycle lanes on the primary road system and 60 miles of park bicycle paths. Through recycling and composting, the City recovers over 50 percent of its residential solid waste, one of the best recovery rates in the country. With more than 30,000 employees, the University of Michigan is the City's largest employer and a central presence in the urban environment.

1.2 LAND USE

The majority of this improvement project will occur within the existing Barton Pump Station building and the adjacent grounds. The site is accessed and maintained by the City as critical water system infrastructure. The installation of ARVs on the City's raw water transmission mains within Bird Hills Nature Area is also included in the planned project. The following subsections present general land use within the City for the purpose of providing background information in the project plan. Existing land use within the City is defined on **Figure 2** in **Appendix A**.

1.2.1 Residential

Approximately 50 percent of all land in the City is residential use, primarily single-family homes and multiple-family units. In the West Area, single-family homes are more concentrated at about 48 percent of land use. Multiple-family units are most heavily concentrated in the South and Northeast Areas, while two-family units are almost exclusively located in the Central and West Areas. The Central Area has the most diverse mix of residential uses, including the highest concentration of group housing.

1.2.2 Office and Commercial

Office and commercial land use each compose 3 to 4 percent of the land in the City. The majority of office and commercial acreage is located in the South Area. The smallest concentration of office use is found in the West Area, and the smallest concentration of commercial use is in the Northeast Area. The Central Area includes the City's central business district with approximately 5 percent of the acreage classified as office or commercial use. Mixed use is more prevalent in the Central Area and is discussed below.

1.2.3 Industrial

There is approximately 2.5 percent of industrial use land in the City, which is most heavily concentrated in the South and Northeast Areas. Over half of the industrial land in the City is used for research facilities with warehouse and heavy manufacturing composing a quarter of the total industrial use acreage.

1.2.4 Transportation/Communications/Utilities

Legal parcels used for transportation, communications, and utilities comprise 3.8 percent of the City. This land is primarily used for parking and utilities. Road transportation and railroad rights of way comprise a significantly higher amount of the City, but are not classified as legal parcels, and were therefore not counted in this inventory.

1.2.5 Public/Institutional

Public and private schools, colleges and universities, religious institutions, hospitals, cemeteries, libraries, City Hall, fire departments, and fraternal organizations compose approximately 10 percent of all land in the City. Almost half of all this land is located in the Northeast Area due to the size of the University of Michigan's North Campus, as well as Concordia College's campus. The remainder of public land is distributed fairly equally between the three other planning areas.

1.2.6 Recreation

Approximately 18 percent of land in the City is devoted to recreational uses. This land use is well balanced among the plan areas ranging from the Northeast Area having the most park land at approximately 19 percent to the Central Area with about 16 percent recreational land.

1.2.7 Vacant

The majority of vacant land is located within the City perimeter. Over half of all vacant land is located in the Northeast Area with most of the remaining vacant land present within Ann Arbor, Scio, and Pittsfield Townships.

1.2.8 Mixed Use

Mixed-use land composes approximately 1.7 percent of all land in the City, with less than a fifth including a residential use. Mixed-use land is the most highly concentrated in the Central Area at about 3.2 percent and the Northeast Area has the smallest concentration at approximately 0.9 percent.

1.2.9 Land Ownership

The City owns the Barton Pump Station site. The scope of work for the planned valve improvement project is primarily within the pump station building or the adjacent site grounds. A sluice gate valve will be replaced in the Barton Dam Powerhouse building which is also owned by the City. Repair or replacement of the raw water transmission main ARVs will occur within the Bird Hills Nature Area that is owned and managed by the City.

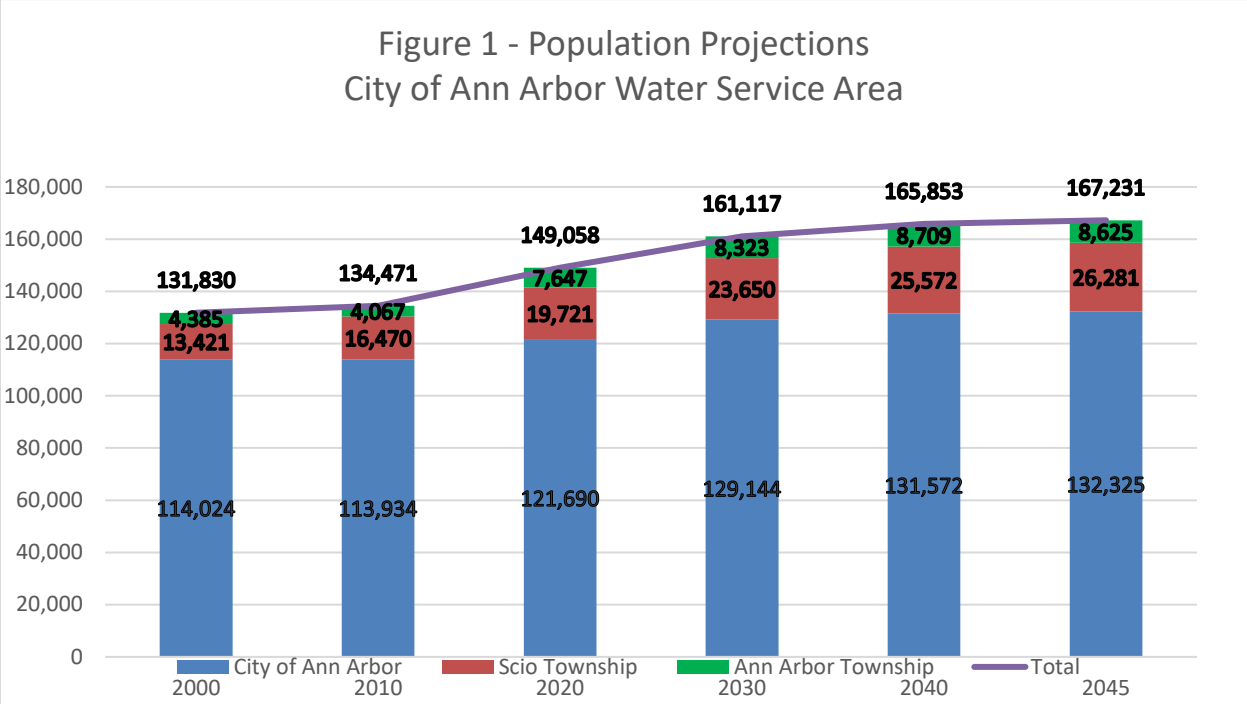
Private land composes about 70 percent of all land in the City. Over two-thirds of this land is residential. Other common private land uses include office, commercial, industrial, vacant, and mixed land uses. Approximately 20 percent of the land in the City is in public ownership (either city, state, or federal public entities). Sixty-six percent of this land is used for recreation. Education and utility facilities uses occupy another 23 percent, while 5 percent of publicly owned land is vacant. The University of Michigan owns about 10 percent of the land in the City. The acreage is primarily occupied by recreational land use (30 percent), followed by educational (25 percent) and residential (14 percent) land uses, respectively.

1.3 POPULATION PROJECTIONS

Within the *Water Treatment and Water Resources Master Plan (CH2M 2006)*, population projections were developed to estimate future water demands in the City's service area. Population projection data are based on the Southeast Michigan Council of Governments (SEMCOG) projections which compiles both U.S. Census data and their own projections. Based on SEMCOG projections updated July 2019, the current population is estimated at 121,690 with an average household size of 2.17 persons per household. A seasonal change in population within the project Study Area is not considered large enough to have a discernable impact on water use within the City.

SEMCOG provides population projections for the City, Ann Arbor Charter Township, and Scio Township by 5-year intervals up to the year 2045. These projections are based on the census taken in 2019. The population of the City is projected to grow from the about 121,690 people to 132,325 by the year 2045. Similarly, Ann Arbor Charter Township is projected to grow from a present population of 7,647 to roughly 8,625, and Scio Township from 19,721 to 26,281 people. Note that these projections include the entire Townships, and the City currently serves only a portion of both Townships. Population projections for the

City's service area are presented below and the SEMCOG community summary data can be referenced in **Appendix D**.



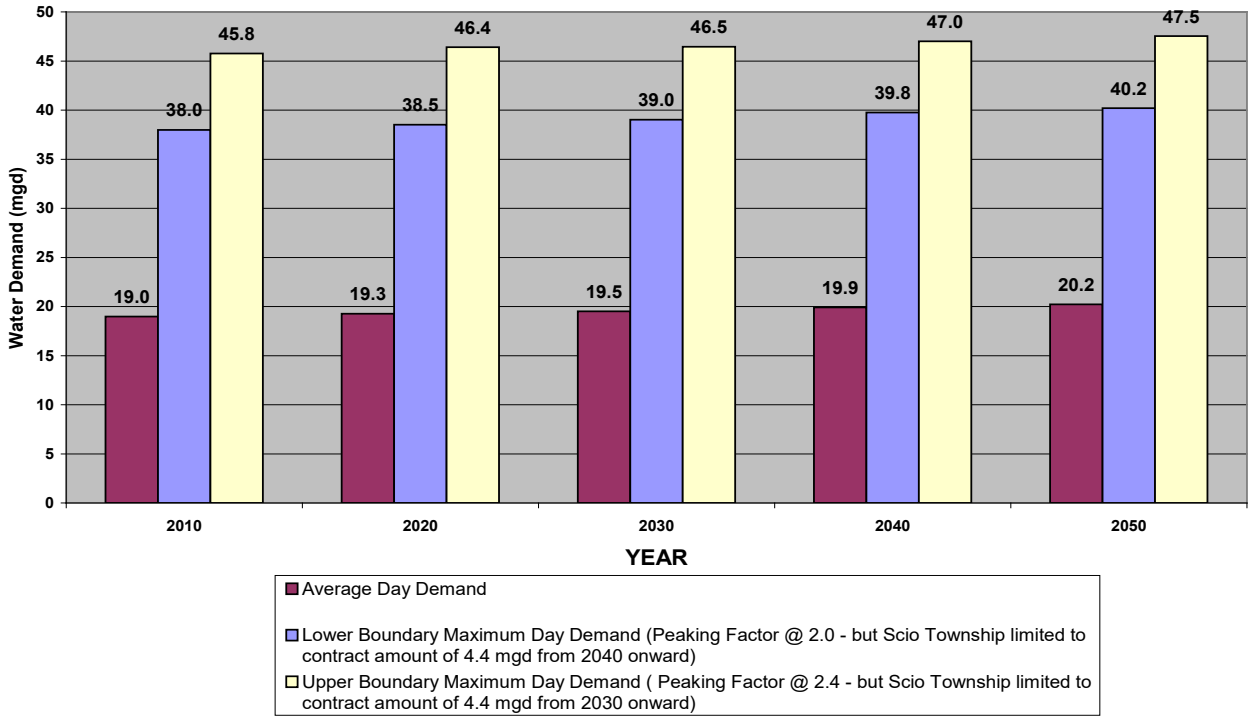
2010 values from U.S. Census, other values are 2019 SEMCOG projections

1.4 WATER DEMAND

A water demand forecast for the City's service area (City of Ann Arbor, Ann Arbor Charter Township [also serving Superior Township], and Scio Township) based on population projections and historical water use was developed in the *Water Treatment and Water Resources Master Plan*. The forecast was developed on a decade-by-decade basis through 2050 as presented in Figure 2 below. The City's *Master Plan* considers a 50-year planning horizon for water supply capacity based on the potentially long lead-time associated with supply development, property procurement (if needed), and securing water rights.

The average per-capita water demand was calculated to be 132 gallons per capita per day (gpcd) for the City, 92 gpcd for Ann Arbor Charter Township, and 86 gpcd for Scio Township. Water that is unaccounted for is included in the per-capita demand, as well as industrial and commercial water usage. Combining population projections with per-capita water demands provided the water demand forecast projections.

Figure 2 – Water Demand Projections



The 2010 census projected lower populations and therefore, lower water demand would be expected. The 2017 Sanitary Survey performed by the Michigan Department of Environmental Quality (MDEQ) provided water demand data from 2012 to 2016 that are lower than the projections shown by Figure 2 above. For the purposes of a DWSRF Project Plan, the above water demand forecast is considered to be conservative. For example, recent average day demand is around 14 million gallons per day (mgd), versus the projected 19 mgd in the *Water Treatment and Water Resources Master Plan*. Based on water demand projection data, it is expected that the existing WTP capacity of 50 mgd will meet the City's current service area water demands through 2050. Similarly, Barton Pump Station's firm capacity of 40 mgd, in combination with the City's groundwater supply well field, will meet the City's current service area source water demands through 2050.

1.5 EXISTING FACILITIES

The City's primary source of raw water supply is surface water withdrawn from the Huron River at Barton Pond. Two (2) pipelines deliver raw water from the Barton Pond Impoundment to the Barton Pump Station: A 24-inch pipeline from a submerged intake structure in Barton Pond and a 36-inch pipeline from the Barton Dam Powerhouse building. Surface water from the Huron River is then pumped to the Ann Arbor WTP via 42-inch pre-stressed concrete cylinder pipe (PCCP) and 24-inch cast iron (CI) transmission mains. The City augments surface water with groundwater from a wellfield located near the Ann Arbor Municipal Airport. Groundwater is pumped to the City's WTP via separate raw water pipelines.

The City owns and operates a 50-mgd lime-softening WTP consisting of two softening plants: Plant 1 with a capacity of 22 mgd, and Plant 2 with a 28 mgd capacity. Treatment processes in Plants 1 and 2 consist of two-stage rapid-mixing, flocculation, and lime softening. Water produced from Plants 1 and 2 is combined and directed through re-carbonation, ozonation, and filtration stages. Ultraviolet light (UV) may be used when necessary to meet final disinfection requirements. Treated water passes through two clearwells, is pumped to the main storage reservoir and distributed to customers in the City's service area by high-service pumps or gravity feed. Monochloramines are used for secondary disinfection in the distribution system.

The City is divided into five pressure districts that receive potable water from the main reservoir. Water is distributed throughout the City from the main reservoir, three outlying reservoirs, four remote pump stations, and two elevated tanks. The distribution system consists of approximately 500 miles of water mains, 3,171 fire hydrants, and 7,403 water main valves. The City's five water distribution system pressure districts are briefly summarized in the following subsections.

1.5.1 Gravity Pressure District

The Gravity Pressure District is the central part of the City and includes the downtown area, the old west side, central campus, and Burns Park. Water is supplied to this district without pumping because the main reservoir is at an elevation significantly above this service area.

1.5.2 West High-Service District

The West High-Service district is on the west side of the City, west of State Street on the south, west of Spring Street on the north, and west of the Gravity District. This district is supplied water from the WTP site via the West High-Service pump station and supplemented by a district storage reservoir and pump station. There is no elevated storage tank in this district, so distribution system pressure is maintained by continuous pumping with variable speed control. Scio Township is supplied water from this district.

1.5.3 Northeast High-Service District

The Northeast High-Service District is largely north of the Huron River and east of North Main and M-14. The district is supplied water from the WTP via East High-Service pumps at the WTP and supplemented by a storage reservoir and pump station. Water pressure in this district is regulated by the height of water in a 0.5-million-gallon elevated storage tank. As water is used in this district, the water level in the elevated

tank drops to a control setpoint elevation, activating a pump at the pump station to refill the tank. Water can also be released from this district into the neighboring districts through pressure reducing valves. Ann Arbor Charter Township is supplied water from this district.

1.5.4 Geddes High-Service District

The Geddes High-Service District is bounded by Washtenaw Avenue on the west and south, Huron River to the north, and US-23 on the east. East High-Service pumps at the WTP provide water to this district and a booster pump station delivers water from the Gravity Pressure District into the Geddes High-Service District. Supply to this district is supplemented by water flowing through two pressure reducing valves that connect the Geddes High-Service District to the Northeast High-Service District.

1.5.5 Southeast High-Service District

The Southeast High-Service District is south of Washtenaw/Stadium and east of State Street. The main source of supply is a 0.5-million-gallon elevated storage tank located within the district. A pump station associated with this tank pumps water into the district. Water in the storage tank is replenished from the Gravity Pressure District under gravity pressure. A remotely operated valve connecting this district to the West High-Service district provides a supplementary source of supply. Water pressure in the Southeast High-Service District is regulated by the height of water in the 0.5-million-gallon elevated tank. As water is used in the district, the tank water level drops to setpoint elevation where a pump is turned on at the pump station to fill the tank.

1.5.6 Condition Summary

A condition assessment of water supply and treatment facilities was conducted as part of the City's *Water Treatment and Water Resources Master Plan*. The assessment included a review of existing maintenance and design information, onsite facility observation, diagnostic testing of equipment, and documentation in data sheets. Approximately 800 pieces of equipment or building components were evaluated to document facility conditions and make recommendations for future improvements.

The City completed a Water Asset Management Program (AMP) in accordance with EGLE requirements and industry best practices. A primary objective of the Water AMP is to perform condition assessments on all critical assets over the next two years, and complete condition assessments of less critical assets over the next 10 years. Based on implementation of the Water AMP and the City's Water Capital Improvement Plan (CIP), future major water infrastructure improvement projects include:

- Dredging the lime residuals lagoon
- Replacing the Huron River intake structure and raw water supply pipelines
- Replacing WTP filter underdrains
- Replacing the WTP – Plant 1 softening basins

In general, the City's water supply and treatment facilities are aging but well maintained. Some assets have served beyond normal expected life but are functioning adequately because of routine maintenance and repair programs. The asset database developed from the condition assessment was used to identify capital improvement projects and can be used to identify future improvements. With completion of the facility and equipment condition assessments and Water AMP, the City has established a sound foundation to plan for major facility improvements and execute a robust maintenance management program.

1.6 SUMMARY OF PROJECT NEED

The City's primary source of raw water supply is surface water withdrawn from the Huron River at Barton Pond. Two (2) pipelines deliver raw water from the Barton Pond impoundment to the Barton Pump Station: A 24-inch pipeline from a submerged intake structure in Barton Pond and a 36-inch pipeline from the Barton Dam powerhouse structure. Surface water from the Huron River is then pumped from Barton Pump Station to the Ann Arbor WTP via 42-inch PCCP and 24-inch CI transmission mains.

Barton Pump Station serves as critical infrastructure, pumping up to 40 mgd (or 85%) of raw source water from the Huron River to the City's WTP for treatment. The remaining 15% of source water is provided as groundwater from the City's well field near the Ann Arbor Municipal Airport. Barton Pump Station was built over 70 years ago and has undergone various improvements and additions. The process valves generally range from 12-inch to 36-inch diameter. Currently, there are numerous valves that are broken, inoperable, leaking, and have exceeded their service life. This project will replace all process valves and major portions of the existing piping at this facility. Together with a condition assessment of the 42-inch PCCP and 24-inch CI raw water transmission mains planned to occur in 2021, replacement of the Barton Pump Station valves and associated piping will improve the reliability of raw source water supply to the City's WTP.

The City retained Stantec to prepare design documents for the Barton Pump Station Valve Improvement Project. Engineering drawings and specifications were completed to the 90% design stage in July 2017 to position the City for potential federal funding. In November 2017, the City experienced a break on the 24-inch CI raw water transmission main and was unable to fully isolate the break for repair. Temporary line-stops were installed to address this as an emergency response situation. The 2017 break on the 24-inch CI raw water main resulted in a temporary shutdown of the City's WTP, which was directly attributed to the inability to effectively operate and close valves in the Barton Pump Station to isolate the 24-inch CI main for repairs. This shutdown event required the City to prepare for potential water restrictions that would have significantly impacted City residents. Replacement of the existing valves and associated piping will provide operational control at the Barton Pump Station and restore the ability for the City to properly isolate raw water supply to the WTP.

As an additional critical infrastructure component, the proposed project will include replacement of three (3) existing air release valves, commonly known as ARVs, on the 42-inch PCCP raw water transmission main, and installation of three (3) new ARVs on the 24-inch CI raw water transmission main. Air release valves are located at high points along a water pipeline that is installed within hilly terrain. The ARV allows air that becomes trapped inside the pipe to discharge, or release, as it accumulates at high points along the pipeline route. Without ARVs, accumulated air can reduce the ability of the pipeline to convey water from one point to another within a given system. When draining a pipeline is necessary, ARVs can allow air into the pipe

to prevent an internal vacuum condition from developing. As such, these ARVs serve critical functions to assure that raw source water can be pumped to the WTP at the rate necessary to supply the City's demand during the peak use periods. There are three (3) existing ARVs on the 42-inch PCCP pipeline that were installed with the pipeline installation in 1965. Two of these ARVs are inoperable, with one location actively leaking. The condition of the other valve is currently unknown. There were no ARVs originally installed on the 24-inch CI pipeline.

Replacement and installation of the ARVs is required to assure that source water supply capacity can be met in a safe and reliable manner. During the 2017 break on the 24-inch CI pipeline, air binding occurred in the pipeline following repairs which resulted in reduced supply capacity from Barton Pump Station to the WTP. This break demonstrated that ARVs are critical components of the raw water supply system. The ARVs are necessary to assure proper filling and draining of the transmission mains and prevent air binding which would result in reduced WTP capacity. As such, the installation of new ARVs on the raw water mains is included with the Barton Pump Station valve and piping replacement work.

1.6.1 Resources

Improvements to the Barton Pump Station and raw water transmission mains presented in this Project Plan are based on condition assessment and engineering evaluation of the existing valves and piping. Additional sources of water system information utilized to prepare the Project Plan content include the Drinking Water Revolving Fund Project Plan, Ann Arbor Water Treatment Plant UV Disinfection System Project (Jacobs 2019) and City WTP staff involvement and feedback.

1.7 EXPLORATORY WELL INVESTIGATIONS, ETC.

As noted in Section 1.6 above, Barton Pump Station and the 42-inch/24-inch transmission mains provide approximately 85% of the City's raw source water from the Huron River. The City's groundwater source well field near Ann Arbor Municipal Airport provides up to 15% raw water supply during peak use periods. The improvements defined in this Project Plan focus on the surface water source supply infrastructure. No additional well investigation activities are necessary or included in the proposed project.

2.0 ANALYSIS OF ALTERNATIVES

A systematic evaluation of alternatives is essential to assure that the most cost-effective solution for major water infrastructure improvements is selected. Alternatives under consideration must seek to first address the primary objectives of the planned project while minimizing to the extent practical the resulting increased user costs to the City's water customers. The overall goal of this project is to correct known problems with the Barton Pump Station valves and piping and the critical ARVs on the raw water transmission mains that will increase reliability and significantly reduce the potential risk to public health and the environment. This section will address the minimum required alternatives in accordance with EGLE guidance for preparing a DWSRF Project Plan and form the foundation for further evaluation of the principal alternative.

2.1 NO-ACTION ALTERNATIVE

A no-action alternative may be considered where existing municipal water system infrastructure (source supply, pumping/transmission, treatment, storage and/or distribution) is compliant with governing standards and/or where no public waterworks facilities currently exist. This alternative must also be considered when the primary purpose of the project is to enlarge the capacity of facilities for future needs and/or to serve currently un-served areas. The proposed improvements in this Project Plan will not increase source water supply capacity or expand the City's overall water system. Barton Pump Station and the existing raw water transmission mains are compliant with EGLE requirements for municipal water systems. However, the existing valves and/or piping are leaking, broken, inoperable, and remain in service well beyond their useful life. This condition presents an unacceptable level of risk for the City and must be addressed through water system improvements.

Electing to accept the no-action alternative will assuredly lead to a continued deterioration of operational control at the Barton Pump Station and overall system reliability for the source water supply infrastructure. As the 2017 and 2020 emergency response events have demonstrated, failures directly attributed to the age and condition of the existing valves and/or piping may result in the temporary interruption or reduced supply capacity to the City's WTP. During the summer in particular, this situation would result in the need for water use restrictions for the City's customers. Emergency repairs of this type are very costly and do not reflect the proactive planning approach defined in the City's Water AMP. Further, persistent failure events with the existing valves or piping that result in significant impacts to the City's source water supply may lead to Notice of Violation citations and Drinking Water and Environmental Health Division, EGLE staff pursuing escalated enforcement action up to and including an Administrative Consent Order if the critical infrastructure problems are not addressed in a comprehensive and timely manner. For these reasons, the no-action alternative is not evaluated further in this Project Plan.

2.2 OPTIMUM PERFORMANCE OF EXISTING FACILITIES

This alternative must consider the extent to which the performance of existing water infrastructure under review can be optimized through changes in system design, alternate process configurations, or improved control and operational enhancements. Stantec performed an assessment of the Barton Pump Station valves and piping leading to completion of 90% design stage documents in July 2017. This work focused on optimizing performance of the existing facilities to the extent feasible. When considering the combined factors of age, condition, and operational reliability status, it was determined that replacement of the existing valves and piping would serve to best optimize the Barton Pump Station facility as existing critical water infrastructure and this option will be further reviewed in this Project Plan as the principal alternative.

2.3 REGIONAL ALTERNATIVES

A regional alternative considers that the City would seek correction to the problems identified in this Project Plan at the Barton Pump Station and transmission main ARVs through connection to a regional system. A regional alternative for water supply was considered in the *WTP Alternatives Evaluation* (Black and Veatch 2015). The Great Lakes Water Authority (GLWA) is the only water utility having capacity to serve the City.

Two alternatives to obtain regional water service from GLWA were evaluated using monetary and non-monetary criteria and compared to upgrading the existing water system and enhancing groundwater supply.

Capital and life-cycle costs were considered, as well as non-economic factors such as capacity, reliability, operational flexibility, staffing, and existing facility use. This evaluation concluded that upgrading the City's water system would be the most cost-effective alternative. Additional benefits were also identified for water system operations, staffing, existing utilities use, and alignment with the City's sustainability goals. Based on the conclusions from this evaluation, and given the improvements defined in this project plan focus on existing critical infrastructure, a regional alternative is not further evaluated in this Project Plan.

3.0 PRINCIPAL ALTERNATIVE

As presented in Section 2.0 above, the no-action approach is not considered a reasonable alternative as it will not proactively address aging or broken valves to eliminate raw source water supply risks. A regional alternative for GLWA supply was previously evaluated and determined to be unfavorable, particularly so for improvements that are focused on existing valves and piping integral to the existing critical infrastructure. Replacement of the Barton Pump Station valves and piping will optimize performance of the existing facility. Replacement of the existing ARVs on the 42-inch PCCP raw water transmission main and installing new ARVs on the 24-inch CI pipeline will assure that a reliable supply of raw source water can be provided from Barton Pump Station to the City's WTP. Therefore, a monetary evaluation of this principal alternative along with a review of potential environmental impacts, project implementability, and technical considerations are presented in this section.

3.1 MONETARY EVALUATION

A total present worth (TPW) analysis was performed for the principal alternative. TPW is the sum which, if invested now at a given interest rate, provides exactly the funds required for paying all present and future costs. It is the sum of the initial capital cost, plus the present worth of the annual Operation, Maintenance and Replacement (OM&R) costs, if applicable, minus the present worth of the salvage value at the end of the 20-year planning period.

The estimated useful life for the project valves and piping are consistent with EGLE project plan preparation guidance. The interest (discount) rate is determined by market conditions. For the purpose of this analysis, a discount rate of 1.875% is used for a 20-year loan based on EGLE guidance. An Engineer's Opinion of Probable Construction Cost (EOPCC) prepared for the principal alternative is provided in **Appendix C**. The capital cost estimate includes the following:

- Estimated construction costs for site work, demolition/removal of existing valves and piping, the installation of new valves and piping, and localized site restoration.
- Contractor overhead and profit, mobilization, bonds, insurance costs, and contingency.
- Engineering costs for final design, permitting, construction services, and commissioning.

- Capital costs based on US dollars, April 2021.
- Escalation to mid-point of construction in 2023 is included.
- Salvage value is not included as the useful life of valves and piping is 30 years minimum.

Annual OM&R costs are projected as minimal for the proposed piping and valves. **Table 3-1** below presents the estimated capital costs, OM&R costs, and the TPW for the principal alternative under consideration.

Table 3-1 – Total Present Worth Analysis

Alternative	General Project Description	Capital Cost	OM&R Cost	20-year TPW
Principal Alternative 1	Replace raw water supply valves, associated piping, and ARVs.	$4,582,705	$6,500	$3,636,749

Financial feasibility is not the sole decision-making criteria for DWSRF projects. Additional considerations that must be reviewed are presented in the following sections.

3.2 ENVIRONMENTAL EVALUATION

An evaluation of potential environmental impacts associated with the valve and piping replacement project is presented in this section and supplemented as necessary in later sections of this Project Plan.

3.2.1 Cultural Resources

The proposed Barton Pump Station valve improvements and transmission main ARVs replacements are not anticipated to impact cultural or historical sites. In accordance with current DWSRF protocol, the work proposed is not an Equivalency Project for FY22 DWSRF projects and, therefore, Water Infrastructure Financing Section, EGLE staff will perform the State Historic Preservation Office (SHPO) and Tribal Historic Preservation Officers (THPO) reviews that are required to determine if work proposed within the project Study Area will affect any sites of historical and/or cultural significance. A confirmation response from EGLE related to the SHPO/THPO reviews has not been received at the time of completing this draft project plan. Once received, the SHPO/THPO documentation obtained from EGLE will be included in **Appendix B.**

3.2.2 Climate

Information from the Michigan Department of Agriculture, Climatology Program indicates that the City has a continental type of climate with larger temperature ranges than locations of similar latitude along the Great Lakes shores. Due to the prevailing westerly winds, the City does experience some lake effect; however, this is minimal and mostly limited to increased cloudiness during the late fall and early winter. The following data was selected from climatological summaries for the City of Ann Arbor station (1981-2010) and the Willow Run Airport station (1981-2010) in collaboration with the Michigan Office of the State Climatologist.

Station Location	Town	Range	Section	Elevation	Latitude	Longitude
Ann Arbor Astronomy Station	2S	6E	22	858 ft	42d 17m	83d 42m
Willow Run Airport Station	3S	8E	7	712 ft	42d 14m	83d 31m

Precipitation:

Mean Annual Total Precipitation – 37.4 inches

Lowest Mean Total Precipitation – 30.5 inches

Highest Mean Total Precipitation – 47.6 inches

Days/Year > 1.25" of Precipitation – 3.7

Temperature:

Mean Annual Temperature – 49.8°F

Mean Annual Minimum Temperature – 40.5°F

Mean Annual Maximum Temperature – 59.1°F

Lowest Mean Annual Temperature – 47.8°F

Highest Mean Annual Temperature – 53.2°F

3.2.3 Air Quality

Construction of the Barton Pump Station and raw water pipeline valve improvement project will not result in prolonged direct or indirect emissions leading to increased air pollution. The majority of construction work will be performed within the Barton Pump Station building. Valve and piping installation outside the pump house is limited, and will occur in strict accordance with City requirements for equipment operation that are intended to limit noise and emissions. Operation of the new valves and piping will not result in air emissions.

3.2.4 Wetlands

A wetland is *land characterized by the presence of water for sufficient frequency and duration to support, and that under normal circumstances does support, wetland vegetation or aquatic life, and is commonly referred to as a bog, swamp, or marsh*. This definition applies to both public and private lands regardless of zoning or ownership. Based on a review of the Natural Wetlands Inventory Map of Washtenaw County provided by EGLE, regulated wetlands are not present within the project Study Area. Due to the localized

nature of this project, the necessary construction activities will not impact wetlands. Refer to **Appendix A, Figure 3** for the Natural Features Inventory map for the project Study Area.

3.2.5 Coastal Zones

The Study Area does not contain any regions classified as coastal zones.

3.2.6 Floodplains

Flooding is a temporary condition of partial or complete accumulation of water on normally dry land areas caused by the overflow of surface water bodies, or from rapid accumulation of surface runoff. Floodplain information obtained from the Federal Emergency Management Agency (FEMA), Flood Insurance Rate Maps (FIRM) over the Study Area is provided in **Appendix A, Figure 4.**

All locations on the 42-inch PCCP and 24-inch CI raw water transmission mains where the existing ARVs will be rehabilitated or replaced are located on upland areas outside of designated floodplains. Construction access to the valve locations will not traverse a floodplain. As shown on **Figure 4**, the 100-year floodplain encroaches within the Barton Pump Station site. However, construction activities necessary to install the new valves and associated yard piping will occur outside the 100-year floodplain elevation of 778.5. As such, no adverse impacts to the floodplain are anticipated.

3.2.7 Natural or Wild and Scenic Rivers

The National Park Service National Wild and Scenic Rivers System and Nationwide Rivers Inventory and Michigan Department of Natural Resources (MDNR), Natural Rivers websites were reviewed. A National Wild and Scenic River is not located in the Study Area. The Huron River is listed by the MDNR as a Natural River. **Appendix A** includes a figure of the Huron River Natural River System. The MDNR designation for the main branch ends upstream of the Barton Pond Impoundment. All work proposed within this Project Plan will occur on upland areas and construction activities will not impact the MDNR designated Natural River stretch of the Huron River.

3.2.8 Major Surface Waters

The Huron River is a major surface water body within the City limits. As noted in Section 3.2.7 above, a portion of this surface water is designated as a Michigan Natural River. There are several hydroelectric dam impoundments on the Huron River, including Barton Pond Impoundment which the City relies on for the majority of raw source water. There are numerous tributaries to the Huron River within the City which are generally shown on **Figure 3** of **Appendix A** as the Natural Features Map. The valve and piping work as defined in the Project Plan will not impact a major surface water within the Study Area.

3.2.9 Agricultural Resources

While there is appreciable agricultural land within Ann Arbor Charter Township and Scio Township that receive water service from the City for a portion of their jurisdictions, very limited agricultural resources are

located within the City. The construction activities proposed in this Project Plan will not impact agricultural lands. The City's existing land use map can be referenced in **Figure 2** of **Appendix A**.

3.2.10 Recreational Areas

As summarized in subsection 1.2.6, the City provides and maintains numerous designated recreational use areas. Barton Pump Station is located within a small portion of the Barton Nature Area and the transmission pipeline ARVs are located within the adjacent Bird Hills Nature Area. As critical water infrastructure, Barton Pump Station has improved vehicle access roads, maintained grounds, and security fencing. A car parking lot for recreational use of the Barton and Bird Hills Nature Areas is located just west of the entrance gate to this facility.

Construction activities necessary to replace the Barton Pump Station valves and piping will occur primarily within the fenced facility site. Access to the site will occur via the facility access road off Huron River Drive and past the nature area parking lot. Construction access and site activities will occur during designated hours as authorized by City requirements to minimize nuisance impact to adjacent land use. Staging areas and soil erosion control silt-fencing will be located within the security fencing and a mud-mat will be required for construction equipment and vehicle access to effectively control off-site soil and/or debris migration.

Construction activities necessary to rehabilitate or replacement the transmission pipeline ARVs will need to be performed within the Bird Hills Nature Area, which is gently rolling and wooded landscape. Construction impact will be localized to a relatively small footprint around the existing ARVs. Specific ARV access routes will be further defined as part of the transmission main condition assessment project planned for 2021. Each access route will be developed to limit impact to the existing natural features from the necessary ground excavation and valve installation equipment.

3.2.11 Topography

The topography at Barton Pump Station gently slopes toward the Huron River. Topography within the Bird Hills Nature Area is characterized as gently rolling with increasing elevation gain from Barton Pump Station at approximately 781 feet above sea level to the City's WTP at approximately 980 feet above sea level.

3.2.12 Geology and Soils

Washtenaw County consists predominantly of glacial outwash, saturated sand and gravel deposits which are separated by layers of clay). These materials, referred to as glacial drift, were deposited as the glaciers receded from this area of the continent about 18,000 years ago. Bedrock underlies the glacial drift deposits and consists of gently to rolling sedimentary rock formations. Three types of bedrock make up the bedrock surface in the County: Marshall Sandstone, Coldwater Shale, and Michigan Shale. According to the United States Department of Agriculture Soil Conservation Service the project area mainly consists of three types of soils: Miami Loam, Wawasee Loam, and Sebewa Loam as summarized the following table:

Table 3-2 – Soil Type Characteristics

SOIL TYPE	TERRAIN	DRAINAGE	SURFACE TEXTURE	GEOLOGIC FORMATION
Miami Loam	Steep (25-35%)	Well-drained	Moderately coarse-textured	Moraines and ice-contact slopes
Wawasee Loam	Nearly level to steep (2-6%)	Well-drained	Moderately coarse-textured	Moraines
Sebewa Loam	Nearly level (0-2%)	Poorly drained	Moderately coarse-textured	Stream terraces and drainageways

3.2.13 Protected Plant and Animal Communities

A Rare Species Review request was made to the Michigan Natural Features Inventory (MNFI) to ascertain whether any species of fauna or flora listed as threatened, endangered, or special concern, or whether the critical habitat of such species is found in the vicinity of the Study Area. MNFI response #2874 was received on April 6, 2021. Stantec also consulted the United States Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) tool to obtain the county distribution of federally listed threatened and endangered species (TES) for Washtenaw County. Seven (7) species are listed as potentially occurring within Washtenaw County, including four (4) endangered and three (3) threatened species. Copies of the USFWS IPaC analysis and determination and the MNFI Rare Species Review #2874 letter are provided in **Appendix B**. A discussion of potential impacts to TES related to this project is presented in Section 5.4.

3.2.14 National Natural Landmarks

The list of National Natural Landmarks (NNL) issued by EGLE was reviewed. None of the listed landmarks are located within the Study Area; therefore, no impacts to NNL are anticipated with the proposed project.

3.3 MITIGATION

Short-term impacts on the community and environment include construction vehicle and equipment access to Barton Pump Station and the ARV installation locations in Bird Hills Nature Area. Minor noise and limited dust pollution from construction activities are anticipated. Soil erosion control and minor vegetation removal can also be expected. Each of these issues will be handled in the project Contract Documents and the associated environmental permits according to the specific phase of construction. Noise pollution to nearby residents and recreational users of the Barton and Bird Hills Nature Areas will be minimized as much as possible by the restriction of allowable work hours.

Construction proposed at Barton Pump Station will occur primarily in the pump house building, with select valve and piping installations within the site grounds external to the building. The Barton Pump Station site is located adjacent to the Huron River. No construction will occur within wetlands and work at the Barton Pump Station site will occur upland from the 100-year flood elevation. Soil erosion control measures are typically called out as bid items, paid for only when performed adequately. Additionally, the Contractor will be expected to comply with the requirements established in the soil erosion control permits, which will be

enforced by both the Engineer and the local enforcement agency. Project restoration and traffic safety will be managed in a similar manner.

Temporary dewatering to facilitate installation of the proposed exterior piping and valves is anticipated and will be governed by the Contract Documents. Filter bags and/or other sediment control provisions will be necessary to assure groundwater withdrawn to support site construction will be adequately treated to comply with water quality narrative standards prior to managed discharge to the Huron River. Significant long-term impacts (noise, air pollution, increased traffic, etc.) are not anticipated. The proposed project is intended to improve the reliability of the existing raw source water supply infrastructure to meet the 20-year planning period and long-term future needs of the City.

3.4 IMPLEMENTABILITY AND PUBLIC PARTICIPATION

The proposed improvement project will replace inoperable and aging water system valves and piping that are critical to operational control and reliability of the City's source water supply. The City is applying for a DWSRF low interest loan to minimize the additional financial burden resulting from the increased cost of this necessary project. The Barton Pump Station site and transmission pipeline ARVs are located within designated Nature Areas that are owned by the City. There are no current or expected future competing uses for these areas. With the complete replacement of problematic existing infrastructure, the City will realize a significant benefit to long-term OM&R of the pump station facility. The City employs experienced utility management and skilled operators and will retain professional services as necessary to effectively manage the construction of this proposed project.

The opportunity for public participation and comment began with a Notice of Public Hearing advertised in the Washtenaw County Legal News and through a City Press Release issued on April 29, 2021. Copies of these public notices are included in **Appendix E**. A draft copy of the DWSRF Project Plan was made available for review by residents and other interested parties at the Water Treatment Plant before the public hearing for a minimum duration of 30 days. The required Public Hearing occurred on Thursday June 3, 2021. Detailed information concerning public comment and issues discussed at the public hearing are documented by an official court recorded transcript included in **Appendix E**.

3.5 TECHNICAL CONSIDERATIONS

The principal alternative for replacing the Barton Pump Station valves and piping and installing new ARVs on the existing raw water transmission mains would comply with Act 399 and current Drinking Water and Environmental Health Division, EGLE regulations. The design and specification for valves, piping, and appurtenances would follow guidelines established in the latest edition of the "Recommended Standards for Waterworks" as published by the Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers (Ten States Standards) and relevant American Water Works Association (AWWA) standards.

Since the rated pumping capacity of the Barton Pump Station will remain unchanged, the primary technical consideration relates to valve type selection and construction sequencing. Valves were evaluated with City operations and management staff based on individual valve location, purpose, and specific requirements

for overall pump station control. Additional considerations in the evaluation process included valve access and operation, preventative maintenance requirements, reliability, and cost.

3.6 RESIDUALS

No water treatment residuals will be generated as part of the valve and piping replacement project.

3.7 CONTAMINATION

There are no areas of known soil and/or groundwater contamination within the planned project construction locations.

3.8 NEW/INCREASED WATER WITHDRAWALS

There are no new or increased water withdrawals associated with the City's source water supply as part of this project. This includes both surface water from Barton Pond and groundwater from the City's well field.

Temporary construction dewatering is anticipated for installation of new piping and valves at the Barton Pump Station site, adjacent to the existing pump house building. Michigan's Water Withdrawal Assessment Tool (WWAT) was utilized to screen for a potential Adverse Resource Impact (ARI) resulting from a short-term withdrawal of groundwater at the site to allow valve and piping installation to occur in the dry. A dewatering withdrawal at a rate greater than 2 MGD would require a water withdrawal permit issued under Part 327 Great Lakes Preservation Act. The WWAT was used to evaluate a new groundwater withdrawal due to temporary construction dewatering performed at a continuous pumping rate of 400 gpm. Based on recent field excavation experience with the emergency response events at the site, this pumping rate is anticipated to be conservative. A report generated from the EGLE WWAT documenting this evaluation is provided in **Appendix B**. The WWAT results indicate a Zone A determination, a withdrawal for temporary construction dewatering at a rate of 400 gpm is not likely to cause an ARI.

4.0 SELECTED ALTERNATIVE

Replacement of the Barton Pump Station valves and piping will restore operational control and optimize performance of the existing facility. Replacement of the existing ARVs on the 42-inch PCCP pipeline and installation of new ARVs on the 24-inch CI pipeline will assure that a reliable supply of raw source water can be provided from Barton Pump Station to the City's WTP. When evaluated against no-action taken or a GLWA regional supply, replacing the existing inoperable and/or aged valves and piping is considered the most feasible and prudent alternative. The selected alterative would include the following major project elements at Barton Pump Station:

- Replace existing 36" x 72" sluice gate valve and actuator in the Barton Dam Powerhouse building. This valve does not fully close and is in relatively poor physical condition. Replacement is required since this valve will be critical to execution of the overall construction sequence for valve and piping replacement at Barton Pump Station.

- Install new 36” gate valve on existing 36” PCCP raw water pipeline from Barton Dam Powerhouse to Barton Pump Station. Location external to pump station building.
- Install new 42” gate valve on existing 42” PCCP raw water transmission main from Barton Pump Station to the WTP. Location external to pump station building.
- Replace existing 16” gate valve on interconnection line between the 24” CI and 42” PCCP raw water transmission mains external to pump station building.
- Install new 24” gate valve within existing meter vault and replace 24” butterfly valve on the 24” CI raw water transmission main external to pump station building.
- Install surge relief piping and valving external to pump station building.
- Replace existing 24” pump suction header piping with new 36” piping for Pumps 2, 3 and 4.
- Replace existing 36” suction piping/valves with new 36” piping and valves for Pumps 1 and 2.
- Replace individual pump suction/discharge piping and associated valves for Pumps 1, 2, 3 and 4.
- Install new discharge flow meter for Pumps 2, 3 and 4 and the Waukesha Pump.
- Install new 20”, 42” and 36” external buried piping to accommodate future connection to the Barton Pump Station from the planned new Barton Pond raw water intake structure 42” raw water pipeline.
- Regrade and top dress pump station gravel access drive and parking lot for Bird Hills and Barton Nature Areas with MDOT 22A stone.

The selected alterative also includes installation of new ARVs in the Bird Hills Nature Area as follows:

- Install three (3) new ARVs on the 24-inch CI raw water transmission main.
- Replace three (3) existing ARVs on the 42-inch PCCP raw water transmission main.
- Repair leaking corporation at existing ARV on the 42-inch PCCP raw water transmission main.

The Barton Pump Station valve and piping improvements are generally identified on **Figure 5** in **Appendix A**. Replacement of the 42-inch PCCP raw water transmission main ARVs and installation of new ARVs on the 24-inch CI raw water pipeline are identified on **Figure 6** in **Appendix A**.

4.1 DESIGN PARAMETERS

As noted in Section 3.5 above, engineering design for valves, piping, and appurtenances would conform to EGLE regulations and guidance, Ten States Standards, and AWWA standards. The project primarily consists of replacing existing valves and piping, with the addition of some new valves and piping exterior to the pump house building. Barton Pump Station capacity will not be increased. Additional piping and valves are included to provide improved operational control of the raw source water supply to the City’s

WTP. The fundamental design parameters include confirming that piping diameter and valve size/type maintain pump station firm capacity of 40 mgd by minimizing flow velocity and head loss at the rated design flows. Final design would also account for valve access, maintenance, and replacement considerations.

4.2 HYDROGEOLOGICAL ANALYSIS

A hydrogeological analysis related to the City's community water supply wells does not apply to this project.

4.3 FINALIZATION OF WELL DESIGN

Finalization of design details for the City's community water supply wells do not apply to this project.

4.4 MAPS

Construction activities will occur within the City of Ann Arbor, primarily at the Barton Pump Station site. Maps are provided in **Appendix A** to define the overall Study Area, work planned at Barton Pump Station, the Barton Dam Powerhouse sluice gate valve replacement, and ARV installations within Bird Hills Nature Area.

4.5 SCHEDULE FOR DESIGN AND CONSTRUCTION

The anticipated schedule for implementation of the proposed water system improvements defined in this Project Plan is presented below considering a Fiscal Year 2022, Quarter 3 loan closing:

Completion of Final Design	December 2021
EGLE Act 399 Permit Issuance	January 2022
DWSRF Part I and II Application	February 2022
Project Bidding	February 2022
Bids Due	March 2022
City Council Contract Award	April 2022
DWSRF Part III Application	April 2022
MFA Loan Closing	June 2022
Contractor Notice to Proceed	July 2022
Complete Shop Drawing Approvals	January 2023
Equipment Manufacture/Delivery	February 2023 – June 2023
Construction Complete	March 2024

4.6 COST ESTIMATE

An estimated construction cost for the Barton Pump Station Valve Replacement Project taking into account escalation and construction contingency is $3,283,486. When including estimated costs for engineering design, DWSRF loan application, and construction phase services of $820,871, and allocations for use of American Iron & Steel and financial impact resulting from the COVID-19 pandemic, the resulting total project construction cost is $4,582,705. The construction cost estimate is provided in **Appendix C**. As noted in

Section 3.1, the estimated annual OM&R cost, including labor, is $6,500 per year and the 20-year net present worth is $3,636,749, using a minimum life expectancy for new valves and piping of 30 years.

4.7 USER COSTS

User costs are projected based on the EOPCC developed for the Barton Pump Station Valve Improvement Project. The cost for debt service attributed to this project is estimated at $276,894 annually. For a total project cost of $4,582,705, an annual water revenue increase of 0.995 percent per year will be necessary. Based on the City's current rate structure, the average residential customer using 18 hundred cubic feet per quarter would realize a water rate increase of 75 cents per quarter or $3.00 per year for the debt service retirement of this project. Over a 20 period, the average residential customer would pay an additional $60.00. The City's current water rates are presented below:

Table 4.1 – Current Ann Arbor Water Rates

	Residential 1 Rate is based on a single water meter used in a home/duplex	**Residential 2** Rate when a second Water-Only meter is also used in a home	**Water Only**** Rate for the second meter for non-sewer water uses, such as for irrigation	**Non-Residential Rate** (Locations may also have a second, Water Only** meter)	**Multi Family Rate** Locations with 3 or more units
1-9 CCFs*	$2.01 per CCF	$2.01 per CCF	$9.90 per CCF	$4.34 per CCF	$2.42 per CCF
10-18 CCFs*	$3.21 per CCF	$3.21 per CCF	$9.90 per CCF	$4.34 per CCF	$2.42 per CCF
19-36 CCFs*	$7.45 per CCF	$3.21 per CCF	$9.90 per CCF	$4.34 per CCF	$2.42 per CCF
Over 36 CCFs*	$15.96 per CCF	$3.21 per CCF	$9.90 per CCF	$4.34 per CCF	$2.42 per CCF
Water Customer Charge	$23.69/quarter for 5/8 inch and 3/4 short standard residential meter; charge varies by meter size	$23.69/quarter for 5/8 inch and 3/4 short standard residential meter; charge varies by meter size	$23.69/quarter for 5/8 inch and 3/4 short standard residential meter; charge varies by meter size	Customer charge varies by size of water meter	Customer charge varies by size of water meter

CCF= hundred cubic feet

Because this is a system-wide impact of the water treatment process, not specific to any customer class nor area, the revenue requirement costs would be borne equally among all customer classifications in the volumetric charges. There are 31,894 Equivalent Residential Units in the system, which are multipliers of the volume flow through a 5/8 meter. Both Ann Arbor Charter Township and Scio Township are under long-term contract with the City to pay revenue requirements which would include the estimated 0.995 percent increase to accommodate the debt service for this project. It should be noted that the user cost impact values are preliminary estimates based on the EOPCC and will be to be further refined by the City's financial consultant during the DWSRF loan process.

4.8 DISADVANTAGED COMMUNITY

The City is not applying for the DWSRF as a disadvantaged community.

4.9 ABILITY TO IMPLEMENT THE SELECTED ALTERNATIVE

With the support from a professional engineering services firm, the City would have the capability to design, permit and manage construction phase activities to accomplish the valve and piping replacements at the Barton Pump Station site and install ARVs on the raw water pipelines as proposed in this Project Plan.

5.0 ENVIRONMENTAL EVALUATION

5.1 HISTORICAL/ARCHAEOLOGICAL/TRIBAL RESOURCES

Facility valve and piping replacement and installation of transmission main ARVs as defined in the proposed Barton Pump Station Valve Improvement Project are not anticipated to impact cultural or historical sites. As the proposed work is not an Equivalency Project for FY22 DWSRF projects, EGLE staff in the Water Infrastructure Financing Section will perform SHPO and THPO reviews to determine if work proposed within the project Study Area will affect any sites of historical, archaeological, and/or cultural significance. A response from EGLE concerning SHPO/THPO reviews has not been received at the draft project plan stage. Once received, the SHPO/THPO documentation obtained from EGLE will be included in **Appendix B** of the Final Project Plan.

5.2 WATER QUALITY

This project will have no adverse impacts on groundwater or surface water quality or quantity. No increases to raw source water supply withdrawals, from both surface water and groundwater sources, are proposed.

Temporary construction dewatering is anticipated to allow installation of new piping and valves at the Barton Pump Station site to occur in the dry. Use of Michigan's WWAT demonstrates that a new withdrawal for temporary construction dewatering is not likely to cause an ARI at the Barton Pump Station site. Regulated dewatering is not anticipated for installation of the raw water transmission main ARVs.

Valve and piping improvements at Barton Pump Station and transmission main ARV installation will result in a beneficial impact to the City's potable water supply. Addressing known problems that could significantly reduce or impair the City's ability to deliver 85% of raw source water from Barton Pond will have a direct benefit to assuring a safe and reliable supply of water for the City's customers.

Disinfection of vales and piping will occur as installed by the contractor based a final construction sequence. All chlorinated water will be directed to the WTP as the valves and piping are placed back into service.

5.3 LAND/WATER INTERFACE

Construction of the proposed project is localized to the developed Barton Pump Station site and upland, wooded property owned by the City within Bird Hills Nature Area. No impact to wetlands, floodplains, rivers/streams, or coastal zones will occur with this project.

5.4 ENDANGERED SPECIES

Use of the USFWS IPaC online screening tool generated a Section 7 listing of TES that may occur within the project Study Area. Of the Section 7 federally listed TES, suitable habitat may be present for both the Indiana bat and northern long-eared bat. For construction access and replacement of transmission main ARVs within Bird Hills Nature Area, and for work on the 42-inch PCCP main at Barton Pump Station, any required clearing of potential roost trees would be completed outside of the April 1 to September 30 window to avoid incidental "take" of these bat species.

No work will occur in the Huron River. Soil erosion and sedimentation control measures will be established to prevent the release of sediment resulting from construction at the Barton Pump Station site. Therefore, no impact to the snuffbox mussel is expected from construction activities on this project. Suitable habitat was not identified for the remaining Section 7 federally listed TES; eastern massasauga rattlesnake, Mitchell's satyr, poweshiek skipperling, and eastern prairie fringed orchid, and construction associated with this project is not expected to impact these species.

A Rare Species Review letter received from MNFI also documents federally listed TES along with the state listed species that may occur within the 1.5-mile buffer around the Study Area. State listed species are not known to be present at Barton Pump Station. Through the future field survey and design phases for the raw water transmission main ARVs, a plant survey will be conducted during the flowering period of target vegetation (August) to verify that state protected plant species are not found within the Study Area for ARV installation based on the limited ARV footprint and access to each ARV location. If necessary, short-term construction access requirements would be developed to avoid impact to an identified state protected plant species prior to commencement of construction activities.

Upon review and based on Stantec's professional opinion, the proposed project will have no or minimal adverse effects on TES or their critical habitats and no sensitive ecosystems will be affected by the project.

5.5 AGRICULTURAL LAND

This project will not impact agricultural land.

5.6 SOCIAL/ECONOMIC IMPACT

The proposed project will significantly improve reliability of the City's raw source water supply infrastructure which is critical to assuring a safe and reliable municipal water supply for the City's customers.

Completion of this project would result in a 0.995 percent increase in water rates for the average residential customer using 18 hundred cubic feet per quarter. This results in a 75 cent per quarter or a $3.00 annual increase and the average residential customer would pay an additional $60.00 over the duration of the 20-year debt repayment period.

5.7 CONSTRUCTION/OPERATIONAL IMPACTS

The majority of construction activity associated with this project will occur at Barton Pump Station. This site is fenced, secured, and generally well hidden from the community within City-owned property. Aside from the occasional recreational use of the surrounding Barton and Bird Hills Nature Areas, minimal impact to the public is anticipated with this project. Construction work required for ARV installation is localized to a small footprint around each ARV location. Access to each ARV will need to occur through Bird Hills Nature Area and the specific routes will be defined in the upcoming field survey and design phases. As with Barton Pump Station, minimal public impact is anticipated due to the relatively secluded location and small work site for each ARV installation. Construction impacts related to this project are described below:

Intermittent construction vehicle traffic on West Huron River Drive and associated feeder routes due to the delivery of materials and site access by workers during the construction phase of the project. This traffic would result in a minor impact to the public's recreational use of the Bird Hills and Barton Nature Area parking lot since this is accessed from the Barton Pump Station drive. Short-term construction access for each transmission main ARV will occur through Bird Hills Nature Area. The future Contract Documents will limit working hours to daytime only based on City standards.

Lead-based paint may be present inside Barton Pump Station on the existing water piping and valves. Asbestos-containing materials (ACM) may also be present in the existing pipe joint gaskets. Demolition and lead paint and ACM abatement provisions will be included in the project Contract Documents with the intent to safely remove all lead-based paint and/or ACM from work areas and dispose of these materials in strict accordance with the applicable U.S. EPA, State of Michigan, Michigan Occupational Safety and Health Administration (MIOSHA), and U.S. Occupational Safety and Health Administration (OSHA) requirements. Health and safety procedures will be developed and enforced to ensure that no untrained or unqualified personnel are exposed to lead-based paint dust and/or ACM during remedial activities.

Once the construction phase is complete, operational impacts will be consistent with current conditions and are not expected to negatively impact the general public.

5.8 INDIRECT IMPACTS

Indirect impacts are those caused by the project but removed in time and/or distance. Indirect impacts are often secondary in nature and are generally caused by residential and/or commercial development made possible by the project. The Barton Pump Station Valve Replacement Project will serve to replace existing critical infrastructure that is inoperable and/or has exceeded useful service life. Source water withdrawal and delivery capacity will remain unchanged. The proposed improvements are not intended to promote additional growth beyond the City's current Master Plan and, therefore, no indirect impacts are anticipated with completion of this project.

6.0 MITIGATION MEASURES

The short-term impacts on the community and environment include limited construction vehicle traffic and minor noise and dust pollution from construction activities. Some soil erosion and minor vegetation removal can also be expected. Each of these issues will be handled in the Contract Documents and associated permits according to the portion of construction in question. Noise pollution will be kept from disturbing the local residents and recreational users of the Barton and Bird Hills Nature Areas as much as possible by the restriction of allowable work hours in accordance with City standards.

Soil erosion control measures are typically called out as bid items, paid for only when performed adequately. Additionally, the contractor(s) will be expected to adhere to the requirements called out in any and all soil erosion control permits, which will be enforced by both the Engineer and the local enforcement agency. Project restoration and traffic safety will be managed in a similar manner. Significant long-term impacts (noise, pollution, hauling traffic, etc.) are not anticipated. The proposed project is intended to improve the reliability of the critical raw source water supply infrastructure to meet the 20-year planning period and long-term needs of the City. Table 6-1 presents the mitigation measures to be performed to address the known environmental impacts associated with the proposed project:

Table 6-1 – Mitigation Measures

Environmental Risk	Mitigation Measures
Increased car/truck traffic on Barton Pump Station access drive and feeder roads. Increased construction traffic on access drive and past Nature Area parking lot.	Limit work to daytime hours only per City standards. Provide signage at entrance to Barton Pump Station site from W. Huron River Drive. Post project status information on City website.
Sediment impact to Huron River	Obtain Soil Erosion & Sedimentation Control (SESC) Permits. Define required SESC measures in Contract Documents. Perform Engineer inspection and enforcement of SESC measures.
Dewatering discharge to Huron River	Validate conservative withdrawal/pumping rate to control groundwater. Obtain WWAT Registration for construction dewatering withdrawal. Define required Dewatering practices in Contract Documents. Discharge to employ engineering controls to meet narrative standards.
Lead-based paint and/or ACM	Perform lead-based paint and/or ACM abatement per regulations. Develop and follow health and safety procedures to reduce risk of accidental exposure.
Floodplain encroachment	Define construction staging/work limits outside 100-year floodplain. Define limits of disturbance/SESC measures in Contract Documents. Perform Engineer inspection, assure activities are upland of 100-year floodplain elevation at Barton Pump Station site.

7.0 PUBLIC PARTICIPATION

Public participation is an integral component of the DWSRF Loan process and the final project plan for the proposed water system improvements. A summary of required public participation is presented in this section with support documentation provided in **Appendix E**.

7.1 FORMAL PUBLIC HEARING

A virtual public hearing was held via Zoom on Thursday June 3, 2021, beginning at 6 p.m. The public hearing concluded at 6:27 p.m. Attendees from the public hearing are documented through a Zoom Attendee Report included within **Appendix E**.

7.2 PUBLIC HEARING ADVERTISEMENT

A notice of the public hearing was advertised on Thursday April 29, 2021 in the Washtenaw County Legal News, a local Ann Arbor newspaper. A copy of the newspaper advertisement and affidavit of publication are included within **Appendix E**. In addition, a press release was issued by the City on April 29, 2021 to the local news media along with a notice of the public hearing placed on the City's website. The City press release is included within **Appendix E**. A draft of the Project Plan was made available for review by the public at the Water Treatment Plant during the minimum 30-day public comment period.

7.3 PUBLIC HEARING TRANSCRIPT

An official court recorder transcript of the Zoom virtual public hearing held on June 3, 2021, as prepared by Hanson Renaissance Court Reporters is included in **Appendix E**.

7.4 PUBLIC HEARING CONTENTS

As part of the Zoom public hearing, a presentation of the Barton Pump Station Valve Improvements Project was given to share information with the public consistent with the EGLE Project Plan Preparation Guidance Document required content. A copy of the public hearing slide presentation is included in **Appendix E**.

7.5 COMMENTS RECEIVED AND ANSWERED

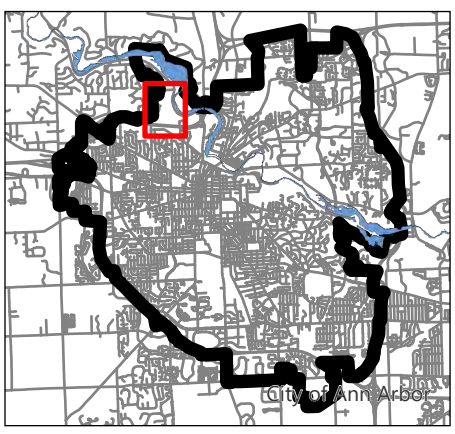
As noted in Section 7.1 above, attendees from the public hearing are documented through a Zoom Attendee Report. Questions received and answered during the public hearing are documented in a Zoom Question Report and the court recorder transcript provided within **Appendix E**.

The City did not receive any comments or questions submitted through the water@a2gov.org email address advertised both in the Washtenaw County Legal News and City Press Release. The City did not receive any persons interested in reviewing the draft project plan available at the Water Treatment Plant during the 30-day public comment period. Therefore, no changes were made to the Barton Pump Station Valve Improvements Project as a result of the public participation process.

7.6 ADOPTION OF THE FINAL PROJECT PLAN

The final project plan will include a resolution from the City of Ann Arbor to formally adopt the project and implement the selected alternative. The date of the City Council meeting for adoption of the resolution is scheduled for June 21, 2021. Once adopted by Council, a copy of the final resolution will be included in the Final Project Plan. A draft resolution prepared for adoption by Council is currently within **Appendix E**.

Appendix A FIGURES



Study Area

0 210 420 Feet

(At original document size of 11x17)
1:6000

N

Stantec

T02S, R06E, S17 & S20
City of Ann Arbor, Washtenaw Co., MI

Project Location

Prepared by CRW on 2021-03-10
TR by CJE on 2021-04-12
IR Review by CJE on 2021-04-12

Client/Project

City of Ann Arbor
Barton Pump Station Valve Improvements

Figure No.

1

Title

Study Area

Notes

1. Coordinate System: NAD 1983 2011 StatePlane Michigan South FIPS 2113 Ft Intl
2. Data Sources: City of Ann Arbor
3. Background: City of Ann Arbor

City of Ann Arbor Land Use

Barton Village

Scio Twp

Ann Arbor Twp

Lodi Twp

Pittsfield Twp

Downtown Area

Land Use

- Residential
- Office
- Commercial
- Industrial
- Transportation / Communication / Utilities
- Public / Quasi-Public / Institutional / Organi
- Recreation
- Mixed Use
- Vacant

0 0.25 0.5 1 1.5 2

Miles

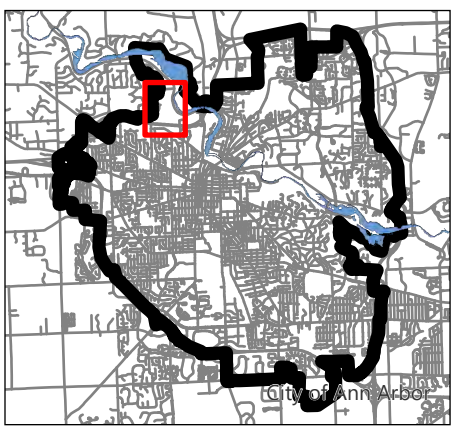
Map date 12/30/2020

Any aerial imagery is circa 2020 unless otherwise noted

Terms of use: www.a2gov.org/terms

CITY OF ANN ARBOR MICHIGAN FOUNDED 1824 INCORPORATED 1851

FIGURE 2 - CURRENT LAND USE



Notes

1. Coordinate System: NAD 1983 2011 StatePlane Michigan South FIPS 2113 Ft Intl
2. Data Sources: City of Ann Arbor
3. Background: City of Ann Arbor

Study Area

Base

Huron River

National Wetlands Inventory (EGLE)

0 210 420 Feet

(At original document size of 11x17)
1:6000

N

Stantec

T02S, R06E, S17 & S20
City of Ann Arbor, Washtenaw Co., MI

Project Location

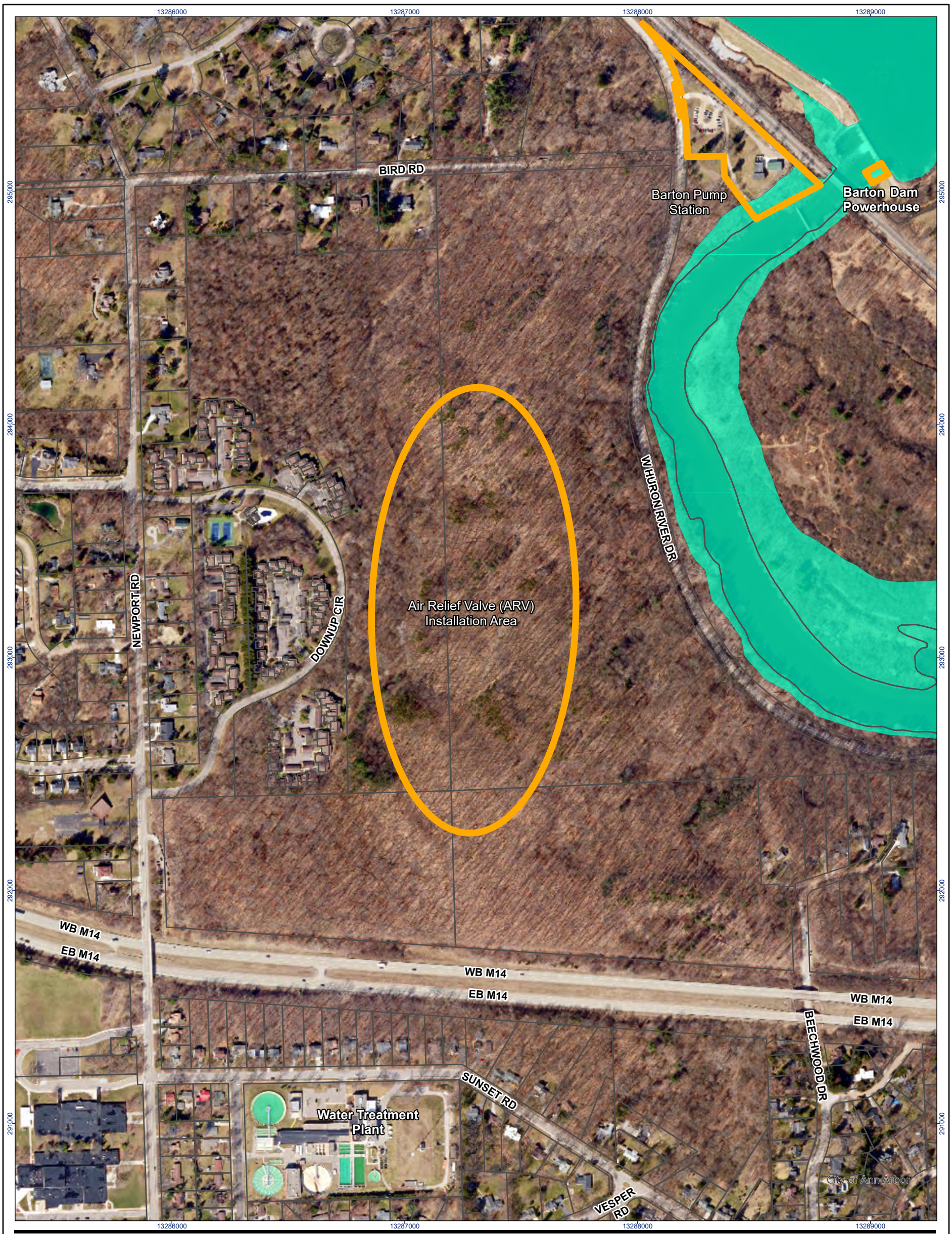
Prepared by CRW on 2021-03-10
TR by CJE on 2021-04-12
IR Review by CJE on 2021-04-12

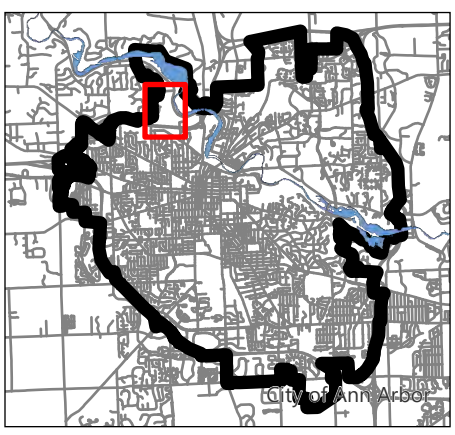
Client/Project

City of Ann Arbor
Barton Pump Station Valve Improvements

Figure No.
3

Title
Natural Features Inventory





Study Area

100-Year Floodplain

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(At original document size of 11x17)
1:6000

N

Stantec

T02S, R06E, S17 & S20
City of Ann Arbor, Washtenaw Co., MI

Project Location

Prepared by CRW on 2021-03-10
TR by CJE on 2021-04-12
IR Review by CJE on 2021-04-12

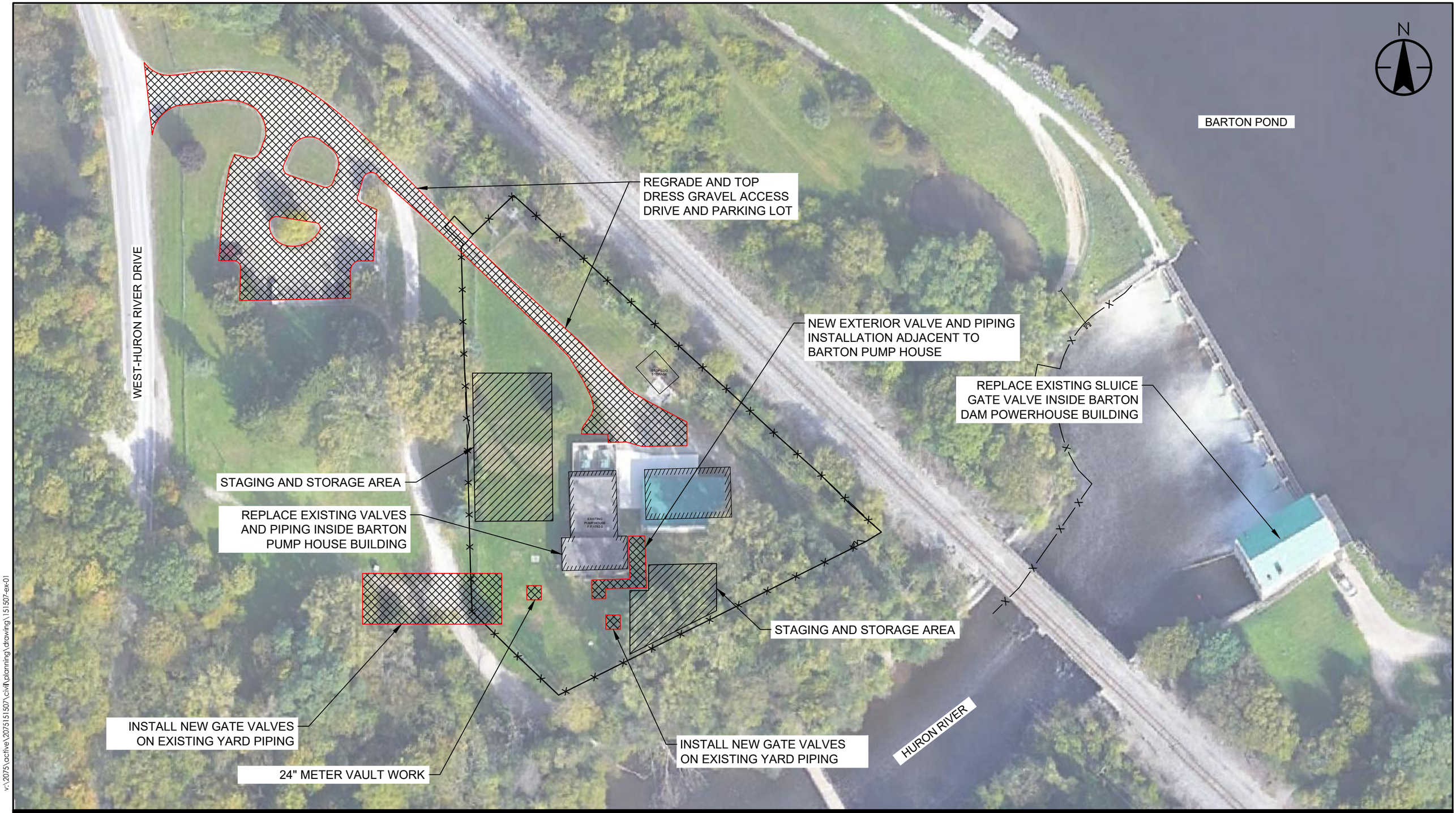
Client/Project

City of Ann Arbor
Barton Pump Station Valve Improvements

Figure No.
4

Title
100-Year Floodplain

Notes
1. Coordinate System: NAD 1983 2011 StatePlane Michigan South FIPS 2113 Ft Intl
2. Data Sources: City of Ann Arbor
3. Background: City of Ann Arbor



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2021.04.12 1:51:07 PM

Stantec

Stantec Consulting Michigan Inc.
3754 Ranchero Drive
Ann Arbor MI 48108-2771
Tel: (734) 761-1010
www.stantec.com

A DRAFT DWSRF PROJECT PLAN			
Issued	By	Appd	YYYY.MM.DD

811 Know what's below. Call before you dig.

NOTE:

THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING MISS DIG PRIOR TO CONSTRUCTION.

Client
CITY OF ANN ARBOR

Project
BARTON PUMP STATION
VALVE REPLACEMENT

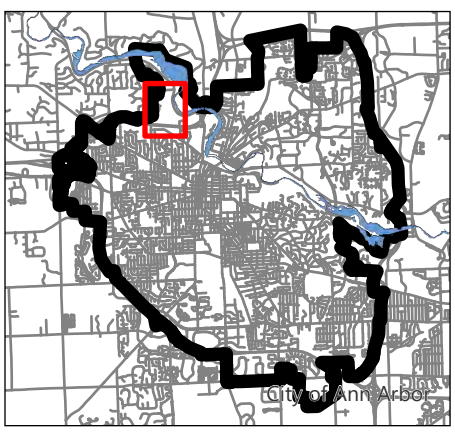
Title
FIGURE 5 - BARTON PUMP STATION IMPROVEMENTS

Project No.
2075151507

Scale
N/A

Drawing No.
FIG.5

Sheet
1 of 1



Study Area

ARV

0 210 420 Feet

(At original document size of 11x17)
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N

Stantec

T02S, R06E, S17 & S20
City of Ann Arbor, Washtenaw Co., MI

Project Location

Prepared by CRW on 2021-03-10
TR by CJE on 2021-04-12
IR Review by CJE on 2021-04-12

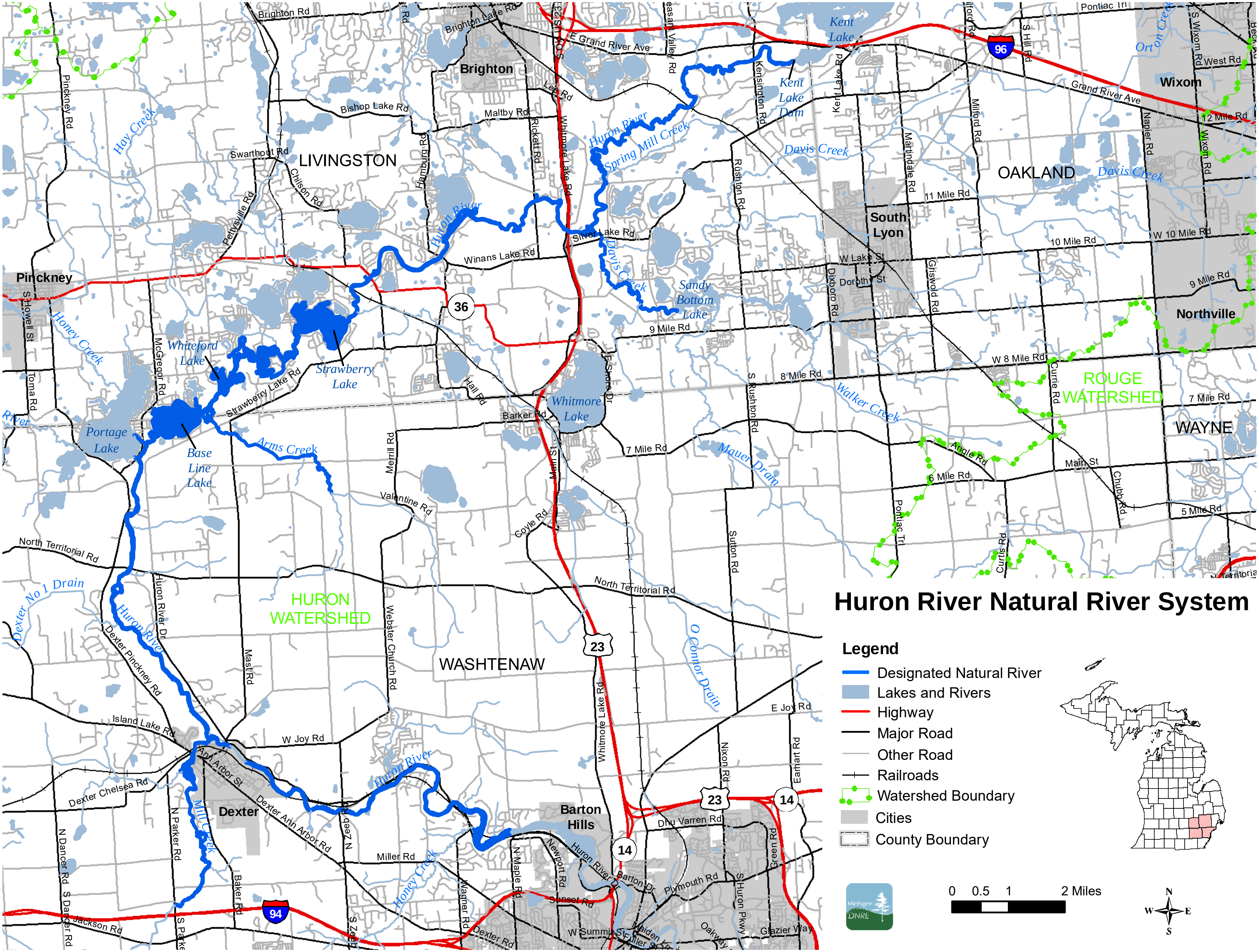
Client/Project

City of Ann Arbor
Barton Pump Station Valve Improvements

Figure No.
6

Title
Raw Water Transmission Main ARV Locations

Notes
1. Coordinate System: NAD 1983 2011 StatePlane Michigan South FIPS 2113 Ft Intl
2. Data Sources: City of Ann Arbor
3. Background: City of Ann Arbor


Huron River Natural River System
Legend
Designated Natural River
Lakes and Rivers
Highway
Major Road
Other Road
Railroads
Watershed Boundary
Cities
County Boundary
0 0.5 1 2 Miles
N
W
E
S
Michigan DNR
LIVINGSTON
OAKLAND
WASHTENAW
WAYNE
HURON WATERSHED
ROUGE WATERSHED
Brighton
Pinckney
Wixom
South Lyon
Northville
Dexter
Barton Hills
Huron River
Spring Mill Creek
Davis Creek
Kent Lake
Kent Lake Dam
Sandy Bottom Lake
Whitmore Lake
Strawberry Lake
Whiteford Lake
Base Line Lake
Portage Lake
Arms Creek
Honey Creek
Hay Creek
Mill Creek
Dexter No 1 Drain
Walker Creek
Mauer Drain
O Connor Drain
Ore Creek
96
94
23
14
36

Appendix B CORRESPONDENCE

MICHIGAN STATE UNIVERSITY | Extension

Ms. Cassandra Winner, PE
Stantec
3754 Ranchero Drive
Ann Arbor, MI 48108

April 6, 2021

Re: Rare Species Review #2874 – City of Ann Arbor DWSRF, Washtenaw County, MI (T02S R06E Sections 17-20).

Ms. Winner:

The location for the proposed project was checked against known localities for rare species and unique natural features, which are recorded in the Michigan Natural Features Inventory (MNFI) natural heritage database. This continuously updated database is a comprehensive source of existing data on Michigan's endangered, threatened, or otherwise significant plant and animal species, natural plant communities, and other natural features. Records in the database indicate that a qualified observer has documented the presence of special natural features. The absence of records in the database for a particular site may mean that the site has not been surveyed. The only way to obtain a definitive statement on the status of natural features is to have a competent biologist perform a complete field survey.

Under Act 451 of 1994, the Natural Resources and Environmental Protection Act, Part 365, Endangered Species Protection, "a person shall not take, possess, transport, …fish, plants, and wildlife indigenous to the state and determined to be endangered or threatened," unless first receiving an Endangered Species Permit from the Michigan Department of Natural Resources (MDNR), Wildlife Division. Responsibility to protect endangered and threatened species is not limited to the lists below. Other species may be present that have not been recorded in the database.

Several at-risk species have been documented within 1.5-miles of the project site and **it is possible that negative impacts will occur**. Keep in mind that MNFI cannot fully evaluate this project without visiting the project site. MNFI offers several levels of Rare Species Reviews, including field surveys which I would be happy to discuss with you.

Sincerely,

Michael A. Sanders

Michael A. Sanders
Environmental Review Specialist/Zoologist
Michigan Natural Features Inventory

MSU EXTENSION

Michigan Natural Features Inventory

PO Box 13036
Lansing MI 48901

(517) 284-6200
Fax (517) 373-9566

mnfi.anr.msu.edu

Comments for Rare Species Review #2874: It is important to note that it is the applicant's responsibility to comply with both state and federal threatened and endangered species legislation. Therefore, if a state listed species occurs at a project site, and you think you need an endangered species permit please contact: Casey Reitz, Michigan DNR Wildlife Division, 517-284-6210, or ReitzC@michigan.gov. If a federally listed species is involved and, you think a permit is needed, please contact Carrie Tansy, Endangered Species Program, U.S. Fish and Wildlife Service, East Lansing office, 517-351-8375, or Carrie_Tansy@fws.gov.

Please consult MNFI's Rare Species Explorer for additional information on Michigan's rare plants and animals.

Table 1: Occurrences of threatened & endangered species within 1.5 miles of RSR #2874

ELCAT	SNAME	SCOMNAME	USESA	SPROT	G_RANK	S_RANK	FIRSTOBS	LASTOBS
Animal	*Clonophis kirtlandii*	Kirtland's snake		E	G2	S1	1902	1902-07
Animal	*Cyclonaias tuberculata*	Purple wartyback		T	G5	S2	1903	1997-04
Animal	*Myotis sodalis*	Indiana bat	LE	E	G2	S1	1946	1965-05-11
Animal	*Lampsilis fasciola*	Wavyrayed lampmussel		T	G5	S2	1903	1958
Animal	*Cygnus buccinator*	Trumpeter swan		T	G4	S3	2017-08-23	2019-06-18
Plant	*Carex lupuliformis*	False hop sedge		T	G4	S2	1926	1926-07-21
Plant	*Hydrastis canadensis*	Goldenseal		T	G3G4	S2	1935	1935-05-23
Plant	*Galearis spectabilis*	Showy orchis		T	G5	S2	1869	1894-05-23
Plant	*Silphium laciniatum*	Compass plant		T	G5	S1S2	1924	1928-06-27
Plant	*Morus rubra*	Red mulberry		T	G5	S2	1880	1880-05-18
Plant	*Hydrastis canadensis*	Goldenseal		T	G3G4	S2	1950-05	2018-06-13
Plant	*Cypripedium candidum*	White lady slipper		T	G4	S2	1940	1940-06-09
Plant	*Hydrastis canadensis*	Goldenseal		T	G3G4	S2	1994	1994-04-27
Plant	*Gentiana alba*	White gentian		E	G4	S1	1906	1906
Plant	*Gentianella quinquefolia*	Stiff gentian		T	G5	S2	1860	1924
Plant	*Chelone obliqua*	Purple turtlehead		E	G4	S1	1995-09-30	2001-10-22
Plant	*Justicia americana*	Water willow		T	G5	S2	2018-09-07	2018-09-07
Plant	*Hydrastis canadensis*	Goldenseal		T	G3G4	S2	1898	2018-08-06
Plant	*Valeriana edulis var. ciliata*	Edible valerian		T	G5T3	S2	1860	1860
Plant	*Morus rubra*	Red mulberry		T	G5	S2	2000-10-27	2000-10-27
Plant	*Justicia americana*	Water willow		T	G5	S2	2018-09-07	2018-09-07
Plant	*Panax quinquefolius*	Ginseng		T	G3G4	S2S3	1867	1867

Comments for Table 1:

Goldenseal - the state threatened goldenseal plant *(Hydrastis canadensis)* has been known to occur in the area. Goldenseal typically inhabits shady, rich, mesic forests, usually under a canopy of beech-sugar maple or oak-sugar maple. It also occurs in moist microhabitats near vernal pools, along streams, or on floodplains, often in moist sandy loam, clay loam, or even organic (muck) soils. Associated plants include basswood, ginseng, trillium, sweet cicely, wild ginger, plantain-leaved sedge, sugar maple, beech, blue-beech, leatherwood, and spicebush. This species flowers in early May and produces fruits through September in Michigan.

Management and Conservation: likely requires maintenance of the overstory and moist, loamy soils and is susceptible to excessive canopy removal. Maintain healthy intact, mature forests and minimize forest fragmentation due to development. When possible, leave large tracts of unharvested forests and allow natural processes to operate unhindered. Although *H. canadensis* populations have been severely diminished through over-harvesting and habitat destruction, it is also a species that can be easily overlooked when obscured by the typical lush vegetation of its forest habitat. Several other state threatened plants often occur in the same habitat as goldenseal.

Red mulberry – the state threatened red mulberry *(Morus rubra)* has been known to occur near the project site. This small to medium-sized tree (6-12 meters high) is often scattered among other hardwoods in river floodplains and fertile bottomlands. In superficial appearance red mulberry is easily confused with basswood, the leaves of which are about the same size. This tree is rare in the southern to southwestern third of the Lower Peninsula, where it reaches its northernmost range in the central U.S. Flowering occurs in May or early June with the leaves, male and female flowers are in dense catkins. Red mulberry produces fruit in July that is bright red at first, then turning blackish.

Management and Conservation: conserve hydrology of river system and corresponding cyclical floodplain regime. Maintain healthy intact, mature floodplain forests, and minimize forest fragmentation. When possible, leave large tracts of unharvested forests and allow natural processes to operate unhindered.

Water willow – the state threatened water willow (*Justicia americana*) has been known to occur in the area. This mat-forming perennial mostly occurs in large river systems and less commonly in lakes. It is almost always found along muddy banks at the edge of the shore. Water willow's pale violet flowers are marked with dark purple borne in axillary clusters near top of the plant. The survey period extends from the first week of August to fourth week of September.

Management and Conservation: Water-willow requires the protection of hydrology. Do not change the course of rivers or add impoundments. Agricultural run-off also likely has negative impacts.

Northern long-eared bat – the state special concern and federally threatened Northern long-eared bat (*Myotis septentrionalis*) has been known to occur in the area. Loss or degradation of summer habitat, wind turbines, disturbance to hibernacula, predation, and pesticides have contributed to declines in Northern long-eared bat populations. However, no other threat has been as severe to the decline as White-nose Syndrome (WNS). WNS is a fungus that thrives in the cold, damp conditions in caves and mines where bats hibernate. The disease is believed to disrupt the hibernation cycle by causing bats to repeatedly awake thereby depleting vital energy reserves. This species was federally listed in May 2015 primarily due to the threat from WNS.

Northern long-eared bats typically roost and forage in forested areas. During the summer, these bats roost singly or in colonies underneath bark, in cavities or in crevices of both living and dead trees. These bats seem to select roost trees based on suitability to retain bark or provide cavities or crevices. Common roost trees in southern lower Michigan included species of ash, elm and maple. Foraging occurs primarily in areas along woodland edges, woodland clearings and over small woodland ponds. Moths, beetles and small flies are common food items. Like all temperate bats this species typically produces only 1-2 young per year.

Management and Conservation: we encourage you to conduct tree-cutting activities and prescribed burns in forested areas during October 1 through March 31. When this is not possible, we encourage you to remove trees prior to June 1 or after July 31, as that will help to protect young bats that may be in forested areas but are not yet able to fly.

Table 2: Occurrences of special concern species & natural features within 1.5-miles of RSR #2874

ELCAT	SNAME	SCOMNAME	USESA	SPROT	G_RANK	S_RANK	FIRSTOBS	LASTOBS
Animal	*Haliaeetus leucocephalus*	Bald eagle		SC	G5	S4	2017	2017
Animal	*Nicrophorus americanus*	American burying beetle	LE	X	G3	SH		1916-08-07
Animal	*Pyrgulopsis letsoni*	Gravel pyrg		SC	GU	SH	1945	1946-11
Animal	*Terrapene carolina carolina*	Eastern box turtle		SC	G5T5	S2S3	1900	1900
Animal	*Alasmidonta marginata*	Elktoe		SC	G4	S3?	1924-10-04	1977
Animal	*Villosa iris*	Rainbow		SC	G5	S3	1903-10-30	1977
Animal	*Noturus miurus*	Brindled madtom		SC	G5	S2	1972-10-03	1972-10-03
Animal	*Utterbackia imbecillis*	Paper pondshell		SC	G5	S2S3	1922-10	1945-09-09
Animal	*Utterbackia imbecillis*	Paper pondshell		SC	G5	S2S3	1946-11	1946-11
Animal	*Ptychobranchus fasciolaris*	Kidney shell		SC	G4G5	S2	1945-09-09	1945-09-09
Animal	*Oxyloma peoriense*	Depressed ambersnail		SC	G4G5	SNR		
Animal	*Sphaerium fabale*	River fingernail clam		SC	G5	SNR		
Animal	*Mesomphix cupreus*	Copper button		SC	G5	S1	1943-05-26	1943-05-26
Animal	*Mesomphix cupreus*	Copper button		SC	G5	S1	1943-05-09	1943-05-09
Animal	*Mesomphix cupreus*	Copper button		SC	G5	S1	1932-05-01	1932-05-01
Animal	*Myotis septentrionalis*	Northern long-eared bat	LT	SC	G1G2	S1	1902-03-01	2003-07-09
Animal	*Myotis lucifugus*	Little brown bat		SC	G3	S1	1948-08-16	1992-08-23
Animal	*Lasmigona compressa*	Creek heelsplitter		SC	G5	S3	1923	1978-11-17
Animal	*Lasmigona costata*	Flutedshell		SC	G5	SNR	1895-08-25	1895-08-25
Animal	*Bombus affinis*	Rusty-patched bumble bee	LE	SC	G2	SH	1917-09-06	1999-09-19
Animal	*Bombus pensylvanicus*	American bumble bee		SC	G3G4	S1	1901-10-05	1936-05-15
Animal	*Bombus pensylvanicus*	American bumble bee		SC	G3G4	S1	1914-05-22	1933-08-05
Animal	*Moxostoma duquesnei*	Black Redhorse		SC	G5	S2	2010	2010
Animal	*Moxostoma duquesnei*	Black Redhorse		SC	G5	S2	2015	2015
Community	Dry-mesic Prairie	High Prairie, Midwest Type			G3	S1	1962	1981-09-02
Plant	*Graphephorum melicoides*	Purple false oats		SC	G4G5	SNR	1892-08-04	1892-09-01
Plant	*Geum virginianum*	Pale avens		SC	G5	S1S2	1915	1915-07-14
Plant	*Hybanthus concolor*	Green violet		SC	G5	S3	1984	1984
Plant	*Scleria triglomerata*	Tall nut rush		SC	G5	S3	1838	1838-06-27
Plant	*Helianthus hirsutus*	Whiskered sunflower		SC	G5	S3	1868	1868-09-16
Plant	*Angelica venenosa*	Hairy angelica		SC	G5	S3		1924-PRE
Plant	*Angelica venenosa*	Hairy angelica		SC	G5	S3	1995	1995-08-25
Plant	*Geum virginianum*	Pale avens		SC	G5	S1S2	1983	1983-07-11

Plant	*Astragalus neglectus*	Cooper's milk vetch		SC	G4	S3	1928	1930-06-24
Plant	*Penstemon pallidus*	Pale beard tongue		SC	G5	SX	1921	1936-06-07
Plant	*Echinacea purpurea*	Purple coneflower		X	G4	SX	1868	1868-09-01
Plant	*Euonymus atropurpureus*	Wahoo		SC	G5	S3	1998-07-28	2001-07-11
Plant	*Carex squarrosa*	Sedge		SC	G4G5	S1	1998-07-24	1998-07-24
Plant	*Viburnum prunifolium*	Black haw		SC	G5	S3	2013-11-05	2013-11-05
Plant	*Lithospermum latifolium*	Broad-leaved puccoon		SC	G4	S2	2018-06-14	2018-06-14
Plant	*Collinsia verna*	Blue-eyed Mary		SC	G5	SNR	1860-00-00	1894-05-20
Plant	*Conioselinum chinense*	Hemlock-parsley		SC	G5	SNR	1879-09-09	1937-09-17
Plant	*Conioselinum chinense*	Hemlock-parsley		SC	G5	SNR	1898-09-29	1937-09-24
Plant	*Jeffersonia diphylla*	Twinleaf		SC	G5	S3	1861	2018-05-16

Comments for Table 2:

Little brown bat - the state special concern little brown bat (*Myotis lucifugus*) has been known to occur near the project site. The little brown bat is formerly one of the most common bats found in the Great Lakes region, but like other cave hibernating bats, it is susceptible to White Nose Syndrome (a fatal fungal infection) and populations in Michigan are undergoing a rapid decline. This small mammal weighs 0.2-0.4 ounces (6-12 grams) and measures only 3.1-3.7 inches (80-95mm) from head to tail. Using echolocation, little brown bats feed primarily on aquatic insects such as stoneflies and mayflies. Typical summer foraging sites include forest edges, along lakes and streams and occasionally over small cultivated fields.

Males and females normally spend the summers in separate locations, coming together in early fall for courtship and mating. Little brown bats over-winter in caves, mines, and sometimes in hollow trees. Females leave their hibernacula in spring and form small groups that move to summer roosts to bear and nurse their young. Females are faithful to these nursing sites typically using them year after year. Young are born from early June through early July. Very little is known about the summer habits of males, but they commonly appear in caves, forests and manmade dwellings during this time. Exterminators kill hundreds of bats each year for roosting in homes and other manmade structures.

Management and Conservation - the following are options for managing habitat for bats: retain trees with loose, scrappy bark such as shagbark hickory (*Carya ovata*) to provide roosting sites. Maintain wooded corridors and riparian areas and streams along streams, rivers, lakes, and ponds. Retain abandoned mines for hibernation and minimize the use of insecticides as they can seriously impact bats. While predation is not a problem, hundreds of little brown bats are killed each year by exterminators for taking roost in homes or other human dwellings. This is unnecessary, as sealing access sites after bats have left for the night is much cheaper, safe, and effective.

Hairy angelica – the state special concern (SC) hairy angelica *(Angelica venenosa)* plant has been known to occur in the area. Hairy angelica inhabits upland woods, especially oak woods; also known from thickets, sandy open ground, and prairie-like areas. Hairy angelica flowers from July to September. Associates include white oak, black oak, pignut hickory, sassafras, and black cherry.

Management and Conservation: this species likely requires disturbance such as prescribed fire to maintain openings. Soil disturbance also may be needed.

Pale avens - the special concern pale avens *(Geum virginianum)* has been known to occur near the project site. Pale avens inhabits openings, low ground, and moist upland woods. This species flowers from June to August. Survey period runs from first week of June to first week of August.

Management and Conservation: relatively little known of biology and ecology of this species in Michigan. The primary need at the present time is a status survey to compile better information on habitat requirements.

Sedge – the special concern sedge *(Carex squarrosa)* has been known to occur near the project site. This sedge is found in floodplain forests in southern Lower Michigan, usually in lower bottoms. Also found in seasonally wet vernal pools in dry-mesic forests and in wet-mesic flatwoods in southeast Michigan. Some occurrences are documented from disturbed habitats, including successional wetlands and an abandoned pasture. Flowering occurs June through September.

Management and Conservation: maintain healthy intact, mature floodplain forests and minimize forest fragmentation. When possible, leave large tracts of unharvested forests and allow natural processes to operate unhindered.

Wahoo – the state special concern (SC) wahoo (*Euonymus atropurpurea*) has been known to occur near the project site. This small shrub or tree (up to 4 meters) species inhabits river banks, moist bottomlands, and floodplain forests. Flowering occurs in June and pinkish red fruit ripen in September.

Management and Conservation: this species requires maintenance of riparian habitat through conservation of hydrological and natural disturbance regimes.

Black haw – the state special concern black haw *(Viburnum prunifolium)* has been known to occur in the area. This tall shrub or small tree usually has several slender trunks and a shallow root system that gives rise to root suckers. Black haw is found in mesic and wet-mesic sites in river floodplains, and along stream banks and swamp margins. It can also be found in open and disturbed areas such as roadsides and lake margins. Small cream-white flowers bloom in May to June after the leaves are present. A bluish-black fruit appears in September. Survey period ranges from first week of July to fourth week of September.

Management and Conservation: conserve riparian habitat via maintenance of hydrological regime and other natural disturbance processes. Excessive timber cutting may possibly impact this species.

Broad-leaved puccoon - the special concern broad-leaved puccoon *(Lithospermum latifolium)* has been known to occur in the area. Broad-leaved puccoon or American gromwell, inhabits shaded river banks, wooded floodplains, and the borders of woods. Flowering occurs in May and June.

Management and Conservation: conserve hydrology of river system and corresponding cyclical floodplain regime. Maintain healthy intact, mature floodplain forests, and minimize forest fragmentation. When possible, leave large tracts of unharvested forests and allow natural processes to operate unhindered.

Twinleaf - the state special concern twinleaf *(Jeffersonia diphylla)* has been known to occur in the area. Twinleaf inhabits rich deciduous woods, including floodplains and well-drained slopes. An attractive, unusual plant, twinleaf blooms very early, usually in April.

Management and Conservation: as a species of special concern, twinleaf is not protected under endangered species legislation, but it is rare in Michigan and should be protected to prevent future listing.

Protect from excessive overstory removal, rutting of soil, and impacts to local hydrology. Maintain healthy intact, mature forests and minimize forest fragmentation due to development. When possible, leave large tracts of unharvested forests and allow natural processes to operate unhindered.

NOTE: special concern species and natural communities are not protected under endangered species legislation, but efforts should be taken to minimize any or all impacts. Species classified as special concern are species whose numbers are getting smaller in the state. If these species continue to decline, they would be recommended for reclassification to threatened or endangered status.

Codes to accompany Tables:

State Protection Status Code Definitions (SPROT)
E: Endangered
T: Threatened
SC: Special concern

Federal Protection Status Code Definitions (USESA)
LE = listed endangered
LT = listed threatened
LELT = partly listed endangered and partly listed threatened
PDL = proposed delist
E(S/A) = endangered based on similarities/appearance
PS = partial status (federally listed in only part of its range)
C = species being considered for federal status

Global Heritage Status Rank Definitions (GRANK)
The priority assigned by NatureServe's national office for data collection and protection based upon the element's status throughout its entire world-wide range. Criteria not based only on number of occurrences; other critical factors also apply. Note that ranks are frequently combined.
G1 = critically imperiled globally because of extreme rarity (5 or fewer occurrences range-wide or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.
G2 = imperiled globally because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.
G3: Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g. a single western state, a physiographic region in the East) or because of other factor(s) making it vulnerable to extinction throughout its range; in terms of occurrences, in the range of 21 to 100.
G4: Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.
G5: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
Q: Taxonomy uncertain

State Heritage Status Rank Definitions (SRANK)
The priority assigned by the Michigan Natural Features Inventory for data collection and protection based upon the element's status within the state. Criteria not based only on number of occurrences; other critical factors also apply. Note that ranks are frequently combined.
S1: Critically imperiled in the state because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extirpation in the state.
S2: Imperiled in state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extirpation from the state.
S3: Rare or uncommon in state (on the order of 21 to 100 occurrences).
S4 = apparently secure in state, with many occurrences.
S5 = demonstrably secure in state and essentially ineradicable under present conditions.
SX = apparently extirpated from state.

Rare Species Review #2874
Section 7 Comments
Stantec Consulting Services
Ann Arbor DWSRF Project Plan
Washtenaw County, MI
April 6, 2021

For projects involving Federal funding or a Federal agency authorization

The following information is provided to assist you with Section 7 compliance of the Federal Endangered Species Act (ESA). The ESA directs all Federal agencies "to work to conserve endangered and threatened species. Section 7 of the ESA, called "Interagency Cooperation," is the means by which Federal agencies ensure their actions, including those they authorize or fund, do not jeopardize the existence of any listed species." The project falls within the range of seven (7) federally listed/proposed species which have been identified by the U.S. Fish and Wildlife Service (USFWS) to occur in Washtenaw County, Michigan:

Federally Endangered

Indiana bat – there appears to be suitable habitat within the 1.5-mile search buffer. Indiana bats (*Myotis sodalis*) are found only in the eastern United States and are typically confined to the southern three tiers of counties in Michigan. Indiana bats that summer in Michigan winter in caves in Indiana and Kentucky. This species forms colonies and forages in riparian and mature floodplain habitats. Nursery roost sites are usually located under loose bark or in hollows of trees near riparian habitat. Indiana bats typically avoid houses or other artificial structures and typically roost underneath loose bark of dead elm, maple and ash trees. Other dead trees used include oak, hickory and cottonwood. Foraging typically occurs over slow-moving, wooded streams and rivers as well as in the canopy of mature trees. Movements may also extend into the outer edge of the floodplain and to nearby solitary trees. A summer colony's foraging area usually encompasses a stretch of stream over a half-mile in length. Upland areas isolated from floodplains and non-wooded streams are generally avoided.

Management and Conservation: the suggested seasonal tree cutting range for Indiana bat is between October 1 and March 31 (i.e., no cutting April 1-September 30). This applies throughout the Indiana bat range in Michigan.

Snuffbox mussel – there appears to be suitable habitat within the 1.5-mile search buffer. The state and federally endangered snuffbox mussel (*Epioblasma triquetra*) inhabits rivers and streams with cobble, gravel, or sand bottoms in swift currents and usually is deeply buried in the substrate. Glochidia, the parasitic larval stage of the mussel, are released from May to mid-July. In Michigan, the only host fish known for snuffbox is the log perch (*Percina caprodes*). In other parts of their range the banded sculpin (*Cottus carolinae*) is also a known host. After completing the parasitic stage and reaching adulthood, snuffbox remain relatively sessile on the river bottom, living between 8-10 years. The best time to survey for snuffbox is April through September.

Management and Conservation: the snuffbox mussel is sensitive to river impoundment, siltation, and disturbance, due to its requirement for clean, swift current and relative immobility as an adult. To maintain the current populations in Michigan, rivers need to be protected to reduce silt loading and run-off. Maintaining or establishing vegetated riparian buffers can aid in controlling many of the threats to mussels. Control of zebra mussels is critical to preserving native mussels. And as with all mussels,

protection of their hosts habitat is also crucial. Because the life cycle of the snuffbox is inherently linked with that of the logperch in Michigan, conservation and management of this fish species is needed to ensure that of the snuffbox.

Poweshiek skipperling – there does not appear to be suitable habitat within the 1.5-mile search buffer. The state and federally endangered poweshiek skipperling *(Oarisma poweshiek)* inhabits alkaline wetlands known as fens. This habitat is characterized by scattered tamaracks, poison sumac, and dogwood clones with a ground cover of sedges and other herbaceous species. The poweshiek skipper has a single generation each year. Egg laying is believed to occur on sedges and rushes. Eggs are laid sometime around early July; larvae (caterpillar stage) hibernate through the winter on the underside of the blade of grass on which they have been feeding on. In early April, they resume feeding. Adult flight dates occur late June through the first three weeks of July.

Management and Conservation: the primary threat to the continued survival of this species is habitat loss and modification. Many of the wetland complexes occupied currently have been altered or drained for agriculture or development. Wetland alteration also can lead to invasion by exotic plant species such as glossy buckthorn (*Rhamnus frangula*), purple loosestrife (*Lythrum salicaria*), common buckthorn (*Rhamnus cathartica*), and the common reed (*Phragmites australis*). In addition, landscape-scale processes that may be important for maintaining suitable poweshiek habitat and/or creating new habitat, such as wildfires, fluctuations in hydrologic regimes, and flooding from beaver (*Castor canadensis*) activity, have been virtually eliminated or altered throughout the species' range. The widespread use of neonicotinoid pesticides could be a cause for the decline in this species as most sites are adjacent to, or downslope from, row crop agriculture.

Mitchell's satyr – there does not appear to be suitable habitat within the 1.5-mile search buffer. The federally endangered and state endangered Mitchell's satyr butterfly *(Neonympha mitchellii mitchellii)* is restricted to calcareous wetlands known as prairie fens. In Michigan, this habitat is characterized by scattered tamaracks, poison sumac, and dogwood with a ground cover of sedges, shrubby cinquefoil, and a variety of herbaceous species with prairie affinities. Adult Mitchell's satyr butterflies are active two to three weeks each summer, with males emerging before females. Adult flight dates are from mid-June to mid-July. Larvae hibernate near the bottom of a sedge. The larval food plant is thought to be several species of sedge. The caterpillar is green with white stripes.

Management and Conservation: the primary threat to the continued survival of this species is habitat loss and modification. Many of the wetland complexes occupied currently have been altered or drained for agriculture or development. Wetland alteration is responsible for extirpating the single known satyr population in Ohio. Wetland alteration also can lead to invasion by exotic plant species such as glossy buckthorn (*Rhamnus frangula*), purple loosestrife (*Lythrum salicaria*), common buckthorn (*Rhamnus cathartica*), and the common reed (*Phragmites australis*). In addition, landscape-scale processes that may be important for maintaining suitable satyr habitat and/or creating new habitat, such as wildfires, fluctuations in hydrologic regimes, and flooding from beaver (*Castor canadensis*) activity, have been virtually eliminated or altered throughout the species' range.

Federally Threatened

Northern long-eared bat – there is a documented occurrence within 1.5 miles of the project site. In addition, this activity occurs within the designated WNS zone (i.e., within 150 miles of positive counties/districts impacted by WNS. The USFWS has prepared a dichotomous key to help determine if

this action may cause prohibited take of this bat. Please consult the USFWS Endangered Species Page for more information.

Northern long-eared bat (*Myotis septentrionalis*) numbers in the northeast US have declined up to 99 percent. Loss or degradation of summer habitat, wind turbines, disturbance to hibernacula, predation, and pesticides have contributed to declines in Northern long-eared bat populations. However, no other threat has been as severe to the decline as White-nose Syndrome (WNS). WNS is a fungus that thrives in the cold, damp conditions in caves and mines where bats hibernate. The disease is believed to disrupt the hibernation cycle by causing bats to repeatedly awake thereby depleting vital energy reserves. This species was federally listed in May 2015 primarily due to the threat from WNS.

Also called northern bat or northern myotis, this bat is distinguished from other *Myotis* species by its long ears. In Michigan, northern long-eared bats hibernate in abandoned mines and caves in the Upper Peninsula; they also commonly hibernate in the Tippy Dam spillway in Manistee County. This species is a regional migrant with migratory distance largely determined by locations of suitable hibernacula sites.

Northern long-eared bats typically roost and forage in forested areas. During the summer, these bats roost singly or in colonies underneath bark, in cavities or in crevices of both living and dead trees. These bats seem to select roost trees based on suitability to retain bark or provide cavities or crevices. Common roost trees in southern lower Michigan included species of ash, elm and maple. Foraging occurs primarily in areas along woodland edges, woodland clearings and over small woodland ponds. Moths, beetles and small flies are common food items. Like all temperate bats this species typically produces only 1-2 young per year.

Management and Conservation: when there are no known roost trees or hibernacula in the project area, we encourage you to conduct tree-cutting activities and prescribed burns in forested areas during October 1 through March 31 when possible, but you are not required by the ESA to do so. When that is not possible, we encourage you to remove trees prior to June 1 or after July 31, as that will help to protect young bats that may be in forested areas but are not yet able to fly.

Eastern prairie fringed orchid – there does not appear to be suitable habitat within the 1.5-mile search buffer. The federally threatened and state endangered prairie fringed orchid *(Platanthera leucophaea)* occurs in two distinct habitats in Michigan - wet prairies and bogs. It thrives best in the lakeplain wet or wet-mesic prairies that border Saginaw Bay and Lake Erie. This species frequently persists in degraded prairie remnants, ditches, railroad rights-of-ways, fallow agricultural fields, and similar habitats where artificial disturbance creates a moist mineral surface conducive to germination.

Unlike many other *Platanthera* species, *P. leucophaea* is long-lived, with individuals documented to live more than 30 years. Flowering occurs during late June through early July. The white blossoms produce a heavy fragrance at dusk that attracts many moths, including the primary pollinators of *P. leucophaea*, hawkmoths (Lepidoptera: Sphingidae). Hawkmoths are likely co-adapted pollinators, since their tongues are long enough to reach the nectar that lies deep in the spur of the flower. Capsules mature in September, releasing hundreds of thousands of airborne seeds. Plants may not flower every year but frequently produce only a single leaf above ground, possibly even becoming dormant when conditions are unsuitable, such as the onset of drought.

Management and Conservation: this species requires the maintenance of natural hydrological cycles and open habitat. Activities such as shrub removal are likely to benefit the species, but other management

such as prescribed fire is not well understood. Caution and proper monitoring should be employed if using prescribed fire in occupied habitat. Spring fires should be conducted prior to emergence (mid-April). Poaching is also a threat.

Eastern massasauga rattlesnake (EMR) – the proposed activity falls outside Tier 1 and Tier 2 EMR habitat as designated by the US Fish and Wildlife Service. The federally threatened and state special concern Eastern massasauga rattlesnake *(Sistrurus catenatus)* is Michigan's only venomous snake and is found in a variety of wetland habitats including bogs, fens, shrub swamps, wet meadows, marshes, moist grasslands, wet prairies, and floodplain forests. Eastern massasaugas occur throughout the Lower Peninsula but are not found in the Upper Peninsula. Populations in southern Michigan are typically associated with open wetlands, particularly prairie fens, while those in northern Michigan are better known from lowland coniferous forests, such as cedar swamps. These snakes normally overwinter in crayfish or small mammal burrows often close to the groundwater level and emerge in spring as water levels rise. During late spring, these snakes move into adjacent uplands they spend the warmer months foraging in shrubby fields and grasslands in search of mice and voles, their favorite food.

Often described as "shy and sluggish", these snakes avoid human confrontation and are not prone to strike, preferring to leave the area when they are threatened. However, like any wild animal, they will protect themselves from anything they see as a potential predator. Their short fangs can easily puncture skin and they do possess potent venom. Like many snakes, the first human reaction may be to kill the snake, but it is important to remember that all snakes play vital roles in the ecosystem. Some may eat harmful insects. Others like the massasauga consider rodents a delicacy and help control their population. Snakes are also a part of a larger food web and can provide food to eagles, herons, and several mammals.

Management and Conservation: any sightings of these snakes should be reported to the Michigan Department of Natural Resources, Wildlife Division. If possible, a photo of the live snake is also recommended.

USFWS Section 7 Consultation Technical Assistance can be found at:

https://www.fws.gov/midwest/endangered/section7/s7process/index.html

The website offers step-by-step instructions to guide you through the Section 7 consultation process with prepared templates for documenting "no effect." as well as requesting concurrence on "may affect, but not likely to adversely affect" determinations.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Michigan Ecological Services Field Office
2651 Coolidge Road Suite 101
East Lansing, MI 48823-6360
Phone: (517) 351-2555 Fax: (517) 351-1443
http://www.fws.gov/midwest/EastLansing/

In Reply Refer To: March 19, 2021
Consultation Code: 03E16000-2021-SLI-1025
Event Code: 03E16000-2021-E-03761
Project Name: Barton Pump Station DWSRF

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The attached species list identifies any federally threatened, endangered, proposed and candidate species that may occur within the boundary of your proposed project or may be affected by your proposed project. The list also includes designated critical habitat if present within your proposed project area or affected by your project. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation.

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the Fish and Wildlife Service if they determine their project may affect listed species or critical habitat.

There are several important steps in evaluating the effects of a project on listed species. Please use the species list provided and visit the U.S. Fish and Wildlife Service's Region 3 Section 7 Technical Assistance website at http://www.fws.gov/midwest/endangered/section7/s7process/index.html. This website contains step-by-step instructions to help you determine if your project may affect listed species and lead you through the section 7 consultation process.

Under 50 CFR 402.12(e) (the regulations that implement section 7 of the Endangered Species Act), the accuracy of this species list should be verified after 90 days. You may verify the list by visiting the ECOS-IPaC website (http://ecos.fws.gov/ipac/) at regular intervals during project planning and implementation and completing the same process you used to receive the attached list.

For all **wind energy projects** and **projects that include installing towers that use guy wires or are over 200 feet in height**, please contact this field office directly for assistance, even if no federally listed plants, animals or critical habitat are present within your proposed project area or may be affected by your proposed project.

Please see the "Migratory Birds" section below for important information regarding incorporating migratory birds into your project planning. Our Migratory Bird Program has developed recommendations, best practices, and other tools to help project proponents voluntarily reduce impacts to birds and their habitats. The Bald and Golden Eagle Protection Act prohibitions include the take and disturbance of eagles. If your project is near an eagle nest or winter roost area, see our Eagle Permits website at https://www.fws.gov/midwest/eagle/permits/index.html to help you avoid impacting eagles or determine if a permit may be necessary.

Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/administrative-orders/executive-orders.php.

We appreciate your concern for threatened and endangered species. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Michigan Ecological Services Field Office
2651 Coolidge Road Suite 101
East Lansing, MI 48823-6360
(517) 351-2555

Project Summary

Consultation Code: 03E16000-2021-SLI-1025
Event Code: 03E16000-2021-E-03761
Project Name: Barton Pump Station DWSRF
Project Type: ** OTHER **
Project Description: Valve improvement project for Barton Pump Station in the City of Ann Arbor.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.3029092,-83.75959370417752,14z

Counties: Washtenaw County, Michigan

Endangered Species Act Species

There is a total of 7 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 1 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Indiana Bat *Myotis sodalis*	Endangered

There is **final** critical habitat for this species. The location of the critical habitat is not available.
Species profile: https://ecos.fws.gov/ecp/species/5949
General project design guidelines:
https://ecos.fws.gov/docs/tess/ipac_project_design_guidelines/doc5663.pdf

Northern Long-eared Bat *Myotis septentrionalis*	Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9045
General project design guidelines:
https://ecos.fws.gov/docs/tess/ipac_project_design_guidelines/doc5664.pdf

Reptiles

NAME	STATUS
Eastern Massasauga (=rattlesnake) *Sistrurus catenatus*	Threatened

No critical habitat has been designated for this species.
This species only needs to be considered under the following conditions:

- For all Projects: Project is within EMR Range

Species profile: https://ecos.fws.gov/ecp/species/2202
General project design guidelines:
https://ecos.fws.gov/docs/tess/ipac_project_design_guidelines/doc5280.pdf

Clams

NAME	STATUS
Snuffbox Mussel *Epioblasma triquetra*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/4135

Insects

NAME	STATUS
Mitchell's Satyr Butterfly *Neonympha mitchellii mitchellii*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/8062

Poweshiek Skipperling *Oarisma poweshiek*	Endangered

There is **final** critical habitat for this species. The location of the critical habitat is not available.
Species profile: https://ecos.fws.gov/ecp/species/9161

Flowering Plants

NAME	STATUS
Eastern Prairie Fringed Orchid *Platanthera leucophaea*	Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/601

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Bittern *Botaurus lentiginosus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/6582	Breeds Apr 1 to Aug 31
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31

NAME	BREEDING SEASON
Black-billed Cuckoo *Coccyzus erythropthalmus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Cerulean Warbler *Dendroica cerulea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974	Breeds Apr 22 to Jul 20
Eastern Whip-poor-will *Antrostomus vociferus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 20
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds elsewhere
Golden-winged Warbler *Vermivora chrysoptera* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8745	Breeds May 1 to Jul 20
Least Bittern *Ixobrychus exilis* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/6175	Breeds Aug 16 to Oct 31
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Long-eared Owl *asio otus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3631	Breeds Mar 1 to Jul 15
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird *Euphagus carolinus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere

NAME	BREEDING SEASON
Semipalmated Sandpiper *Calidris pusilla* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Willow Flycatcher *Empidonax traillii* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/3482	Breeds May 20 to Aug 31
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

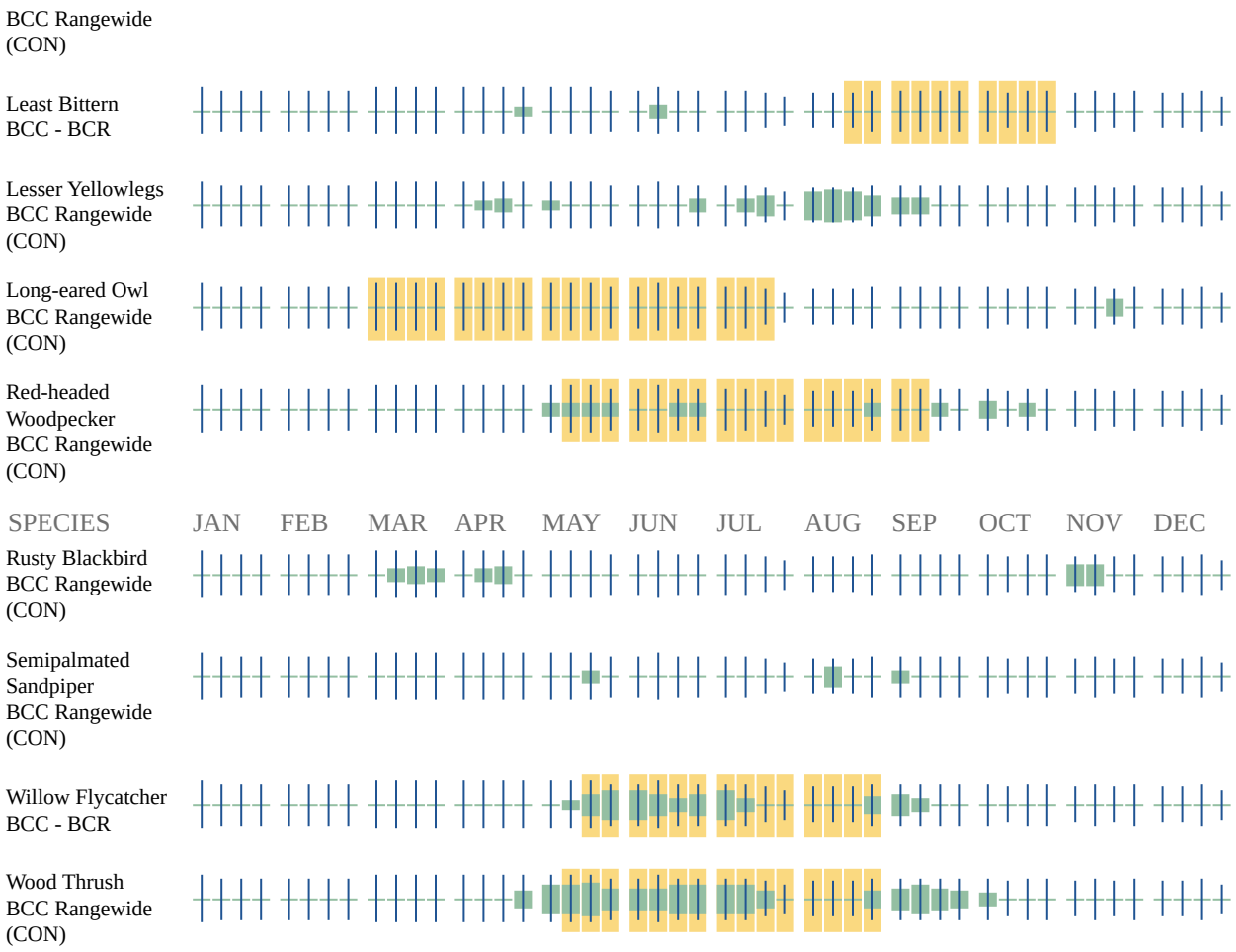
Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding

in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);

2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities,

should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

RIVERINE

- R5UBFx
- R2UBH

Print

Withdrawal Assessment Report

MICHIGAN.GOV Michigan's Official Web Site

This is NOT a registration

4/9/2021

Results

The proposed withdrawal has passed the screening process. The projected impact of the withdrawal lies within 'Zone A' and is not likely to cause an adverse resource impact.

Registration

This withdrawal has not been registered. A large quantity withdrawal with a capacity of 70 gallons per minute or more must be registered before the withdrawal can begin.

To register, return to the water withdrawal screening results page and proceed as directed. For help, contact anyone in the Water Use Program http://www.michigan.gov/deqwateruse

Summary

Home Watershed:	21284
Debited Watersheds (gpm):	21284 (329.9)
Pumping Capacity (gpm):	400
Well Casing Depth(ft):	10
Withdrawal Source:	Groundwater
Aquifer Type:	Glacial
Pumping Frequency:	Intermittent
Hrs/Day:	24
Days/Week:	7
Months of Year:	3,4,5,6,7,8,9,10
Latitude:	42.307984
Longitude:	-83.756020
Total Annual Withdrawal (gallons):	140,765,184

DISCLAIMER: The Water Withdrawal Assessment Tool is designed to estimate the likely impact of a proposed water withdrawal on nearby streams. It is not an indication of how much groundwater may be available for your use. The quantity and quality of groundwater varies greatly with depth and location. You should consult with a water resources professional or a local well driller about groundwater availability at your location.

Appendix C COST ESTIMATES

STANTEC CONSULTING MICHIGAN INC - ENGINEER'S OPINION OF CONSTRUCTION COST

Stantec

City of Ann Arbor - Water Treatment Services
Barton Pump Station Valve Replacement Project
Drinking Water State Revolving Fund Project Plan

Conceptual	
30% Design	
60% Design	
90% Design	X
Final - Bid Set	

Project Number:	2075151507
Prepared By:	NJW/KDJ
Checked By:	GSS/CJE
Date:	April 5, 2021

	DESCRIPTION	QUANT.	UNIT	UNIT COST	TOTAL COST
Work By Contractor					
1	General Mobilization	1	LS	$125,000.00	$125,000.00
2	Dewatering, Well Point System Complete in Place: Eight (8) Months	1	LS	$215,000.00	$215,000.00
Valve Group No. 1					
3	Power House Sluice Gate Replacement, Complete in Place	1	LS	$126,000.00	$126,000.00
Valve Group No. 2					
4	Excavation	1	LS	$50,000.00	$50,000.00
5	Installation and Removal of 24" Line Stop	2	EA	$50,000.00	$100,000.00
6	Demolition of Existing PCCP and RCP	1	LS	$48,000.00	$48,000.00
7	Installation of 36" PCCP Piping, Gate Valve, and Line Drain System. Complete in Place	1	EA	$164,000.00	$164,000.00
8	Installation of 42" PCCP Piping, Gate Valve, and Line Drain System. Complete in Place	1	EA	$192,000.00	$192,000.00
9	Removal and Installation of 24" Gate Valves, Complete in Place	3	EA	$29,000.00	$87,000.00
10	Removal and Installation of 16" Gate Valves, Complete in Place	1	EA	$10,500.00	$10,500.00
Valve Group No. 3					
11	Excavation	1	LS	$17,000.00	$17,000.00
12	Installation and Removal of 20" Line Stop	1	EA	$33,000.00	$33,000.00
13	Demolition of Existing Piping and Valves	1	LS	$68,000.00	$68,000.00
14	Installation of Piping and Valves	1	LS	$192,000.00	$192,000.00
Valve Group No. 4					
15	Demolition of Existing Piping and Valves	1	LS	$68,000.00	$68,000.00
16	Installation of Piping and Valves	1	LS	$250,000.00	$250,000.00
Valve Group No. 5					
17	Excavation	1	LS	$38,500.00	$38,500.00
18	Demolition of Existing Piping and Valves	1	LS	$68,000.00	$68,000.00
19	Installation of Piping and Valves	1	LS	$245,000.00	$245,000.00
20	Thrust Blocks	1	LS	$11,000.00	$11,000.00
Valve Group No. 6					
21	Excavation	1	LS	$5,500.00	$5,500.00
22	Demolition of Existing Valve	1	LS	$2,200.00	$2,200.00
23	Installation of Valve	1	LS	$26,500.00	$26,500.00
Raw Water Transmission Main ARVs					
24	Install ARV on 42-inch PCCP Transmission Main	3	EA	$55,000.00	$165,000.00
25	Repair Leaking Corporation on 42-inch PCCP Transmission Main	1	LS	$10,000.00	$10,000.00
26	Install ARV on 24-inch CI Transmission Main	3	EA	$53,000.00	$159,000.00
				CONSTRUCTION SUBTOTAL	**$2,476,000**
				ESCALATION - ANNUAL 2021 TO 2023 3%	**$150,788**
				ESCALATED OPINION OF PROBABLE CONSTRUCTION COST	**$2,626,788**
				CONSTRUCTION CONTINGENCY 25%	**$656,697**

STANTEC CONSULTING MICHIGAN INC - ENGINEER'S OPINION OF CONSTRUCTION COST

City of Ann Arbor - Water Treatment Services
Barton Pump Station Valve Replacement Project
Drinking Water State Revolving Fund Project Plan

Conceptual	
30% Design	
60% Design	
90% Design	X
Final - Bid Set	

Project Number:	2075151507
Prepared By:	NJW/KDJ
Checked By:	GSS/CJE
Date:	April 5, 2021

DESCRIPTION	QUANT.	UNIT	UNIT COST	TOTAL COST
OPINION OF PROBABLE CONSTRUCTION COST WITH CONTINGENCY				**$3,283,486**
MARKET ADJUSTMENT FACTOR DUE TO COVID-19			10%	**$328,349**
ENGINEERING, DWSRF-PROJECT PLAN, CONSTRUCTION SERVICES, FINANCE, ADMIN AND LEGAL			25%	**$820,871**
USE OF AMERICAN IRON & STEEL				**$150,000**
TOTAL OPINION OF PROBABLE CONSTRUCTION COST				**$4,582,705**

NOTE:

The ENGINEER has no control over the cost of labor, materials, equipment, or services furnished by others, or over the CONTRACTOR's method of determining prices, or over competitive bidding or market conditions. Opinions of probable project costs and construction costs provided herein are made on the basis of the ENGINEER'S professional judgment and experience. The ENGINEER cannot and does not guarantee that proposals, bids or actual project or construction costs will not vary from the prepared opinion of probable cost.

Appendix D POPULATION PROJECTIONS

SEMCOG | Southeast Michigan Council of Governments

Community Profiles

YOU ARE VIEWING DATA FOR:

City of Ann Arbor

301 E Huron St
Ann Arbor, MI 48104-1908
http://www.a2gov.org

SEMCOG MEMBER

Census 2010 Population: 113,934
Area: 27.6 square miles

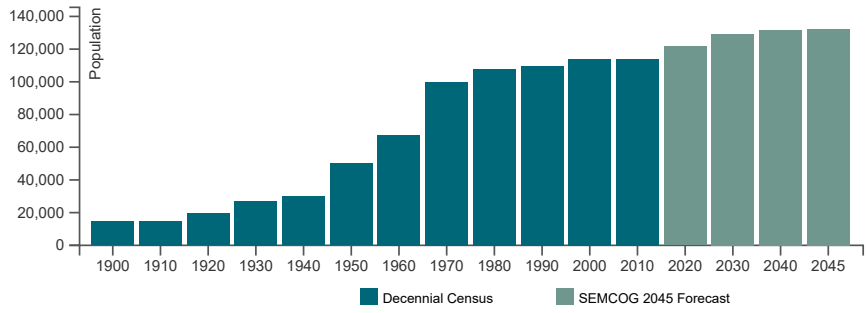
VIEW COMMUNITY EXPLORER MAP

Population and Households

Link to American Community Survey (ACS) Profiles: **Select a Year** 2019 **Social** | **Demographic**

Population and Household Estimates for Southeast Michigan, 2020

Population Forecast



Note for City of Ann Arbor : 1950 population includes the City of East Ann Arbor. East Ann Arbor was disincorporated by 1960 Census and annexed to City of Ann Arbor.

Population and Households

Population and Households	Census 2010	Change 2000-2010	Pct Change 2000-2010	SEMCOG Jul 2020	SEMCOG 2045
Total Population	113,934	-90	-0.1%	120,495	132,325
Group Quarters Population	11,840	-549	-4.4%	14,452	15,906
Household Population	102,094	459	0.5%	106,043	116,419
Housing Units	49,789	2,571	5.4%	51,360	-
Households (Occupied Units)	47,060	1,367	3.0%	48,946	50,208
Residential Vacancy Rate	5.5%	2.3%	-	4.7%	-
Average Household Size	2.17	-0.05	-	2.17	2.32

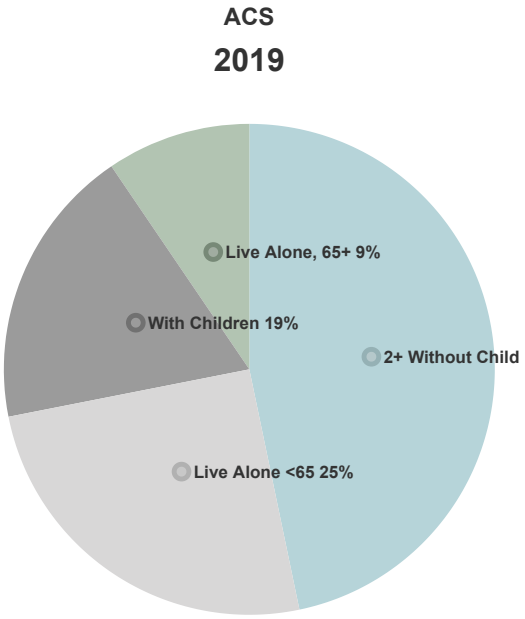
Source: **U.S. Census Bureau**, **SEMCOG Population and Household Estimates**, and **SEMCOG 2045 Regional Development Forecast**

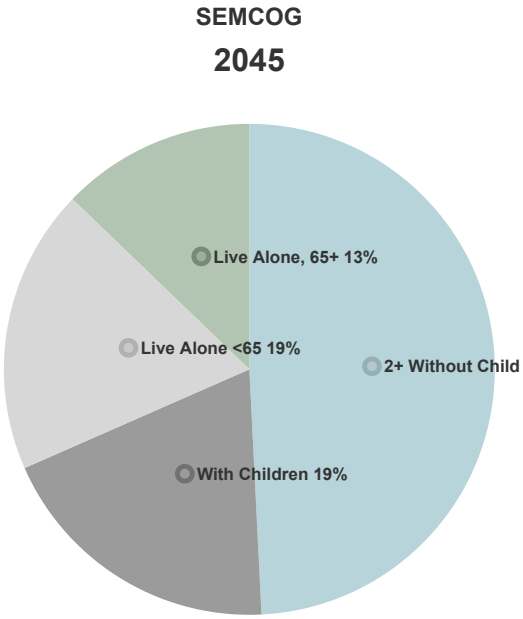
Components of Population Change

Components of Population Change	2000-2005 Avg.	2006-2010 Avg.	2011-2018 Avg.
Natural Increase (Births - Deaths)	990	782	536
Births	1,657	1,311	1,082
Deaths	667	529	546
Net Migration (Movement In - Movement Out)	-1,249	-541	266
Population Change (Natural Increase + Net Migration)	-259	241	802

Source: **Michigan Department of Community Health Vital Statistics**, **U.S. Census Bureau**, and SEMCOG

Household Types

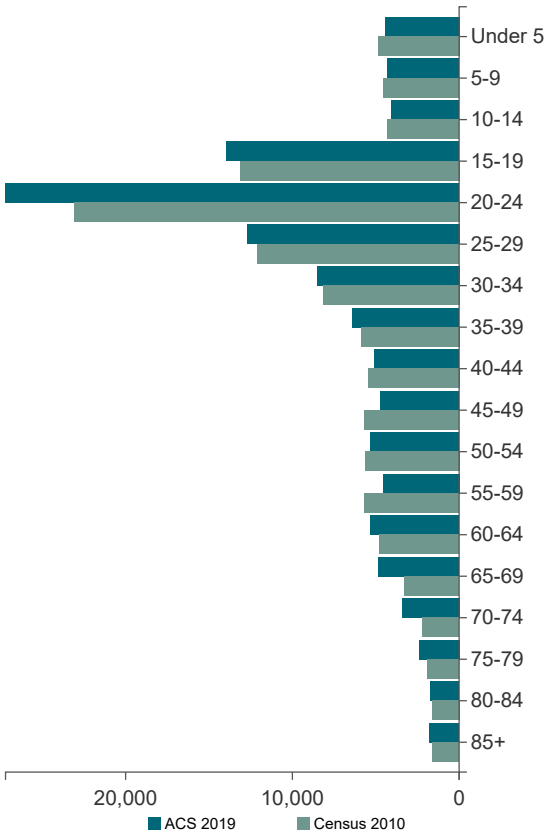




Household Types	Census 2010	ACS 2019	Change 2010-2019	Pct Change 2010-2019	SEMCOG 2045
With Seniors 65+	8,020	10,058	2,038	25.4%	17,700
Without Seniors	39,040	37,707	-1,333	-3.4%	32,508
Live Alone, 65+	3,695	4,537	842	22.8%	6,430
Live Alone, <65	13,901	12,026	-1,875	-13.5%	9,429
2+ Persons, With children	9,446	8,883	-563	-6%	9,642
2+ Persons, Without children	20,018	22,319	2,301	11.5%	24,707
Total Households	47,060	47,765	705	1.5%	50,208

Source: **U.S. Census Bureau**, **Decennial Census**, **2015-2019 American Community Survey 5-Year Estimates**, and **SEMCOG 2045 Regional Development Forecast**

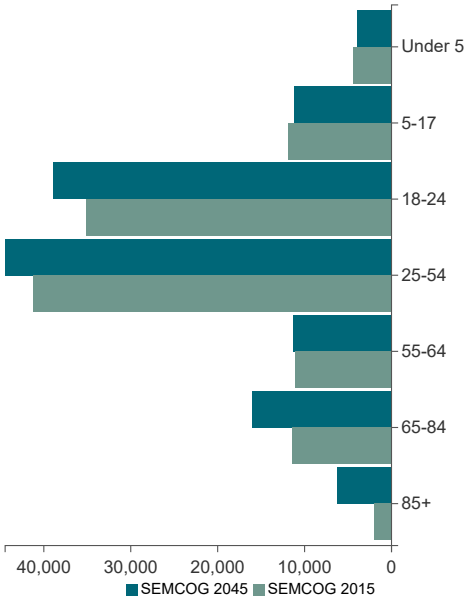
Population Change by Age, 2010-2019



Age Group	Census 2010	Change 2000-2010	ACS 2019	Change 2010-2019
Under 5	4,868	-876	4,443	-425
5-9	4,531	-674	4,297	-234
10-14	4,284	-845	4,051	-233
15-19	13,146	498	13,939	793
20-24	23,091	2,173	27,203	4,112
25-29	12,112	513	12,725	613
30-34	8,166	-1,058	8,530	364
35-39	5,888	-1,862	6,411	523
40-44	5,466	-1,555	5,089	-377
45-49	5,669	-1,276	4,710	-959
50-54	5,650	-287	5,316	-334
55-59	5,667	1,602	4,565	-1,102
60-64	4,784	1,962	5,337	553
65-69	3,280	830	4,818	1,538
70-74	2,176	-57	3,428	1,252
75-79	1,906	-14	2,400	494
80-84	1,633	376	1,699	66
85+	1,617	460	1,774	157
Total	113,934	-90	120,735	6,801
Median Age	27.8	-0.3	27.5	-0.3

Source: **U.S. Census Bureau**, **Decennial Census**, and **2015-2019 American Community Survey 5-Year Estimates**

Forecasted Population Change 2015-2045



Age Group	2015	2020	2025	2030	2035	2040	2045	Change 2015 - 2045	Pct Change 2015 - 2045
Under 5	4,401	4,283	4,239	4,183	4,114	4,073	3,997	-404	-9.2%
5-17	11,949	11,627	11,232	11,155	11,243	11,393	11,199	-750	-6.3%
18-24	35,144	35,763	37,450	37,786	38,078	38,789	38,995	3,851	11%
25-54	41,254	42,042	42,669	44,137	44,268	44,011	44,452	3,198	7.8%
55-64	11,091	12,171	12,427	11,810	11,333	11,230	11,320	229	2.1%
65-84	11,443	13,570	15,459	16,780	17,380	16,736	16,090	4,647	40.6%
85+	2,021	2,234	2,551	3,293	4,077	5,340	6,272	4,251	210.3%
Total	117,303	121,690	126,027	129,144	130,493	131,572	132,325	15,022	12.8%

Source: **SEMCOG 2045 Regional Development Forecast**

Older Adults and Youth Populations

Older Adults and Youth Population	Census 2010	ACS 2019	Change 2010-2019	Pct Change 2010-2019	SEMCOG 2045
60 and over	15,396	19,456	4,060	26.4%	28,037
65 and over	10,612	14,119	3,507	33%	22,362
65 to 84	8,995	12,345	3,350	37.2%	16,090
85 and Over	1,617	1,774	157	9.7%	6,272
Under 18	16,382	15,417	-965	-5.9%	15,196
5 to 17	11,514	10,974	-540	-4.7%	11,199
Under 5	4,868	4,443	-425	-8.7%	3,997

Note: Population by age changes over time because of the aging of people into older age groups, the movement of people, and the occurrence of births and deaths.

Source: **U.S. Census Bureau**, **Decennial Census**, **2015-2019 American Community Survey 5-Year Estimates**, and **SEMCOG 2045 Regional Development Forecast**

Race and Hispanic Origin

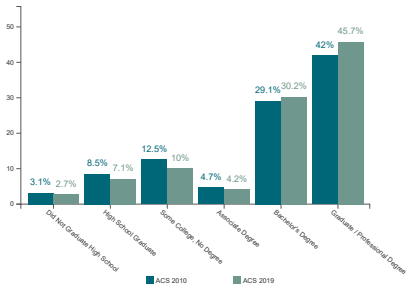
Race and Hispanic Origin	Census 2010	Percent of Population 2010	ACS 2019	Percent of Population 2019	Percentage Point Change 2010-2019
Non-Hispanic	109,268	95.9%	114,946	95.2%	-0.7%
White	80,158	70.4%	81,518	67.5%	-2.8%
Black	8,658	7.6%	8,027	6.6%	-1%
Asian	16,293	14.3%	20,270	16.8%	2.5%
Multi-Racial	3,605	3.2%	4,468	3.7%	0.5%
Other	554	0.5%	663	0.5%	0.1%
Hispanic	4,666	4.1%	5,789	4.8%	0.7%
Total	113,934	100%	120,735	100%	0%

Source: **U.S. Census Bureau**, **Decennial Census**, and **2015-2019 American Community Survey 5-Year Estimates**

Highest Level of Education

Highest Level of Education*	ACS 2010	ACS 2019	Percentage Point Chg 2010-2019
Did Not Graduate High School	3.1%	2.7%	-0.4%
High School Graduate	8.5%	7.1%	-1.5%
Some College, No Degree	12.5%	10%	-2.5%
Associate Degree	4.7%	4.2%	-0.5%
Bachelor's Degree	29.1%	30.2%	1.1%
Graduate / Professional Degree	42%	45.7%	3.7%

* Population age 25 and over

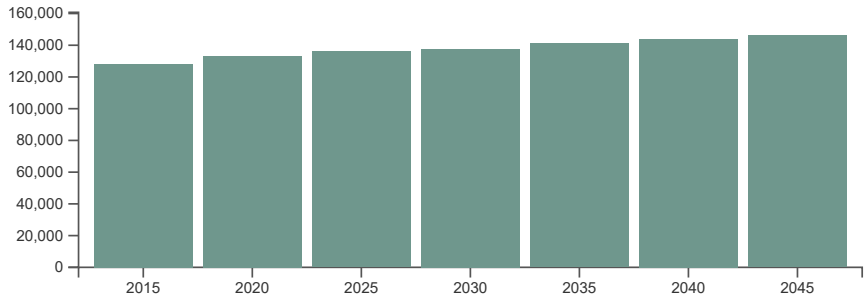


Source: **U.S. Census Bureau, 2006-2010 and 2015-2019 American Community Survey 5-Year Estimates**

Economy & Jobs

Link to American Community Survey (ACS) Profiles: **Select a Year** 2019 **Economic**

Forecasted Jobs



Source: **SEMCOG 2045 Regional Development Forecast**

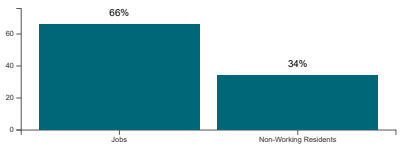
Forecasted Jobs by Industry Sector

Forecasted Jobs By Industry Sector	2015	2020	2025	2030	2035	2040	2045	Change 2015-2045	Pct Change 2015-2045
Natural Resources, Mining, & Construction	1,601	1,866	2,002	2,097	2,209	2,315	2,391	790	49.3%
Manufacturing	2,104	2,119	1,884	1,637	1,498	1,254	1,116	-988	-47%
Wholesale Trade	994	967	986	968	890	897	844	-150	-15.1%
Retail Trade	7,937	8,481	8,585	8,353	8,335	8,159	7,940	3	0%
Transportation, Warehousing, & Utilities	1,720	1,753	1,733	1,726	1,786	1,762	1,811	91	5.3%
Information & Financial Activities	10,329	10,260	10,035	9,787	9,928	9,897	10,004	-325	-3.1%
Professional and Technical Services & Corporate HQ	10,897	10,883	11,048	11,302	11,635	12,061	12,457	1,560	14.3%
Administrative, Support, & Waste Services	4,854	4,611	4,497	4,439	4,542	4,596	4,637	-217	-4.5%
Education Services	40,550	42,416	43,480	44,250	45,249	46,163	46,851	6,301	15.5%
Healthcare Services	30,009	31,523	32,668	33,444	34,721	36,012	37,179	7,170	23.9%
Leisure & Hospitality	10,549	11,204	11,607	11,905	12,545	12,847	13,126	2,577	24.4%
Other Services	4,396	4,999	5,275	5,306	5,401	5,436	5,398	1,002	22.8%
Public Administration	2,149	2,214	2,256	2,290	2,323	2,351	2,378	229	10.7%
Total Employment Numbers	128,089	133,296	136,056	137,504	141,062	143,750	146,132	18,043	14.1%

Source: **SEMCOG 2045 Regional Development Forecast**

Daytime Population

Daytime Population	ACS 2016
Jobs	112,878
Non-Working Residents	58,396
Age 15 and under	14,352
Not in labor force	40,524
Unemployed	3,520
Daytime Population	171,274



Source: **2012-2016 American Community Survey 5-Year Estimates** and **2012-2016 Census Transportation Planning Products Program (CTPP)**. For additional information, visit SEMCOG's **Interactive Commuting Patterns Map**

Note: The number of residents attending school outside Southeast Michigan is not available. Likewise, the number of students commuting into Southeast Michigan to attend school is also not known.

Where Workers Commute From 2016

Rank	Where Workers Commute From *	Workers	Percent
1	**Ann Arbor**	40,326	35.7%
2	**Pittsfield Twp**	7,775	6.9%
3	**Ypsilanti Twp**	7,763	6.9%
4	**Out of the Region, Instate**	7,255	6.4%
5	**Ypsilanti**	3,666	3.2%
6	**Scio Twp**	3,343	3%
7	**Canton Twp**	2,873	2.5%
8	**Superior Twp**	1,804	1.6%
9	**Out of State**	1,770	1.6%
10	**Hamburg Twp**	1,695	1.5%
-	**Elsewhere**	34,608	30.7%
* Workers, age 16 and over employed in Ann Arbor		**112,878**	**100%**

Source: **U.S. Census Bureau** - 2012-2016 CTPP/ACS Commuting Data and **Commuting Patterns in Southeast Michigan**

Where Residents Work 2016

Rank	Where Residents Work *	Workers	Percent
1	**Ann Arbor**	40,326	69.1%
2	**Pittsfield Twp**	2,560	4.4%
3	**Ann Arbor Twp**	1,668	2.9%
4	**Scio Twp**	1,642	2.8%
5	**Out of the Region, Instate**	1,124	1.9%
6	**Ypsilanti**	1,057	1.8%
7	**Dearborn**	991	1.7%
8	**Detroit**	961	1.6%
9	**Superior Twp**	714	1.2%
10	**Livonia**	657	1.1%
-	**Elsewhere**	6,697	11.5%
* Workers, age 16 and over residing in Ann Arbor		**58,397**	**100%**

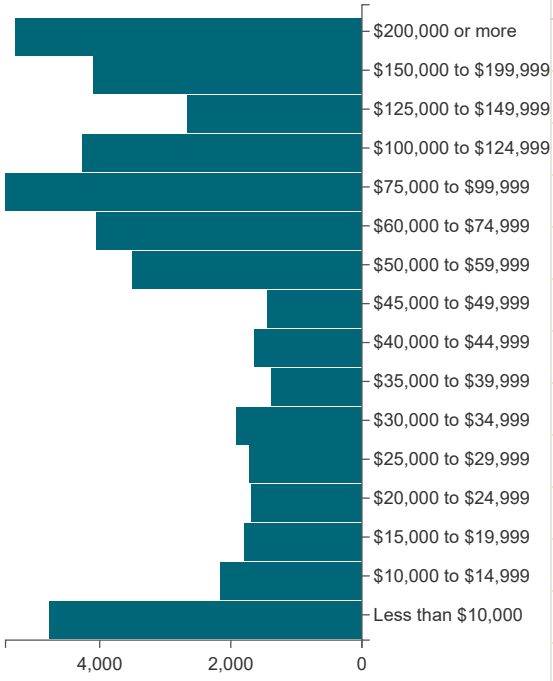
Source: **U.S. Census Bureau** - 2012-2016 CTPP/ACS Commuting Data and **Commuting Patterns in Southeast Michigan**

Household Income

Income (in 2019 dollars)	ACS 2010	ACS 2019	Change 2010-2019	Percent Change 2010-2019
Median Household Income	$61,700	$65,745	$4,045	6.6%
Per Capita Income	$35,757	$42,674	$6,917	19.3%

Source: **U.S. Census Bureau**, **2006-2010 and 2015-2019 American Community Survey 5-Year Estimates**

Annual Household Income



Annual Household Income	ACS 2019
$200,000 or more	5,280
$150,000 to $199,999	4,092
$125,000 to $149,999	2,655
$100,000 to $124,999	4,270
$75,000 to $99,999	5,437
$60,000 to $74,999	4,047
$50,000 to $59,999	3,501
$45,000 to $49,999	1,444
$40,000 to $44,999	1,636
$35,000 to $39,999	1,381
$30,000 to $34,999	1,910
$25,000 to $29,999	1,721
$20,000 to $24,999	1,681
$15,000 to $19,999	1,793
$10,000 to $14,999	2,152
Less than $10,000	4,765
Total	**47,765**

Source: **U.S. Census Bureau**, **2015-2019 American Community Survey 5-Year Estimates**

Poverty

Poverty	ACS 2010	% of Total (2010)	ACS 2019	% of Total (2019)	% Point Chg 2010-2019
Persons in Poverty	20,318	20.2%	24,213	22.3%	2.2%
Households in Poverty	8,004	17.7%	8,723	18.3%	0.5%

Source: **U.S. Census Bureau**, **2006-2010 and 2015-2019 American Community Survey 5-Year Estimates**

Housing

Link to American Community Survey (ACS) Profiles: **Select a Year** 2019 **Housing**

Building Permits 2000 - 2021

Year	Single Family	Two Family	Attach Condo	Multi Family	Total Units	Total Demos	Net Total
2000	118	10	163	63	354	36	318
2001	71	34	62	108	275	11	264
2002	42	4	283	0	329	4	325
2003	54	12	199	56	321	10	311
2004	55	8	171	29	263	12	251
2005	36	4	101	77	218	17	201
2006	28	12	80	64	184	19	165
2007	10	12	182	107	311	13	298
2008	8	4	0	100	112	6	106
2009	9	6	4	165	184	2	182
2010	13	2	32	0	47	8	39
2011	10	2	0	321	333	12	321
2012	9	4	0	336	349	56	293
2013	26	0	19	194	239	2	237
2014	23	4	3	265	295	9	286
2015	17	4	4	434	459	7	452
2016	23	4	50	323	400	3	397
2017	26	2	79	487	594	3	591
2018	57	0	145	421	623	2	621
2019	63	0	61	322	446	55	391
2020	40	44	51	308	443	7	436
2021	2	0	6	0	8	0	8
2000 to 2021 totals	740	172	1,695	4,180	6,787	294	6,493

Source: **SEMCOG Development**

Note: Permit data for most recent years may be incomplete and is updated monthly.

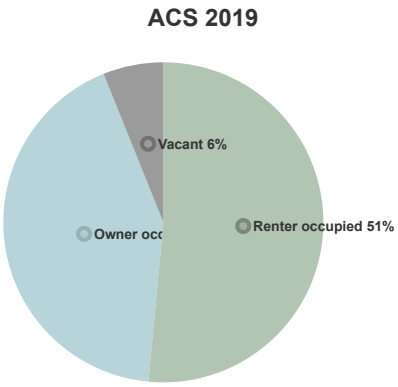
Housing Types

Housing Type	ACS 2010	ACS 2019	Change 2010-2019	New Units Permitted Since 2018
Single Unit	20,416	21,069	653	162
Multi-Unit	29,357	29,527	170	1,358
Mobile Homes or Other	98	267	169	0
Total	49,871	50,863	992	1,520
Units Demolished				-64
Net (Total Permitted Units - Units Demolished)				1,456

Source: **U.S. Census Bureau**, **2006-2010 and 2015-2019 American Community Survey 5-Year Estimates**, **SEMCOG Development**

Housing Tenure

Housing Tenure	Census 2010	ACS 2019	Change 2010-2019
Owner occupied	21,078	21,579	501
Renter occupied	25,982	26,186	204
Vacant	2,729	3,098	369
Seasonal/migrant	259	587	328
Other vacant units	2,470	2,511	41
Total Housing Units	49,789	50,863	1,074



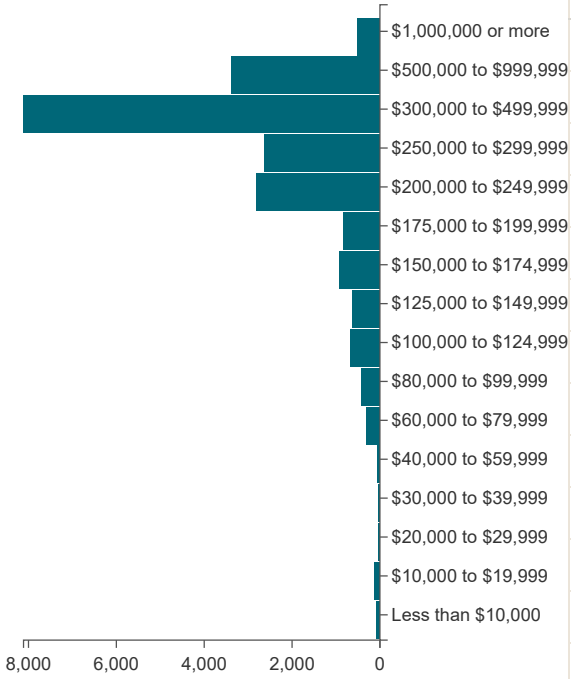
Source: **U.S. Census Bureau**, **2006-2010 and 2015-2019 American Community Survey 5-Year Estimates**

Housing Value and Rent

Housing Value (in 2019 dollars)	ACS 2010	ACS 2019	Change 2010-2019	Percent Change 2010-2019
Median housing value	$295,644	$323,400	$27,756	9.4%
Median gross rent	$1,163	$1,237	$74	6.3%

Source: **U.S. Census Bureau**, **Census 2000**, **2006-2010 and 2015-2019 American Community Survey 5-Year Estimates**

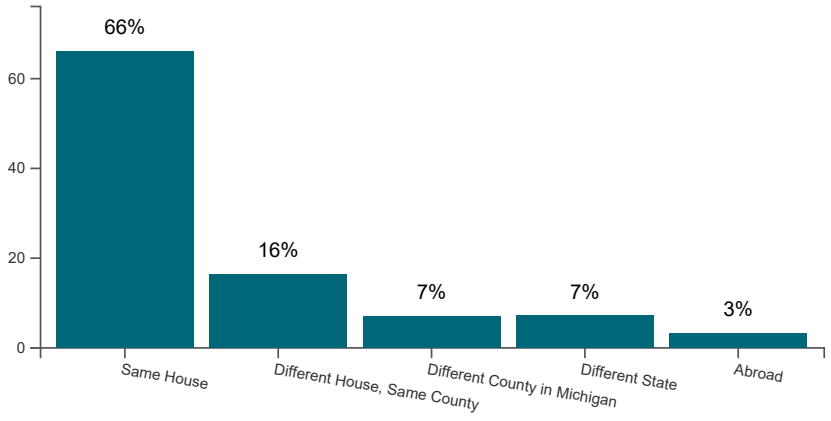
Housing Value



Housing Value	ACS 2019
$1,000,000 or more	522
$500,000 to $999,999	3,380
$300,000 to $499,999	8,113
$250,000 to $299,999	2,632
$200,000 to $249,999	2,815
$175,000 to $199,999	833
$150,000 to $174,999	927
$125,000 to $149,999	622
$100,000 to $124,999	672
$80,000 to $99,999	421
$60,000 to $79,999	305
$40,000 to $59,999	68
$30,000 to $39,999	42
$20,000 to $29,999	42
$10,000 to $19,999	116
Less than $10,000	69
Owner-Occupied Units	21,579

Source: **U.S. Census Bureau**, **2015-2019 American Community Survey 5-Year Estimates**

Residence One Year Ago *



* This table represents persons, age 1 and over, living in City of Ann Arbor from 2015-2019. The table does not represent person who moved out of City of Ann Arbor from 2015-2019.

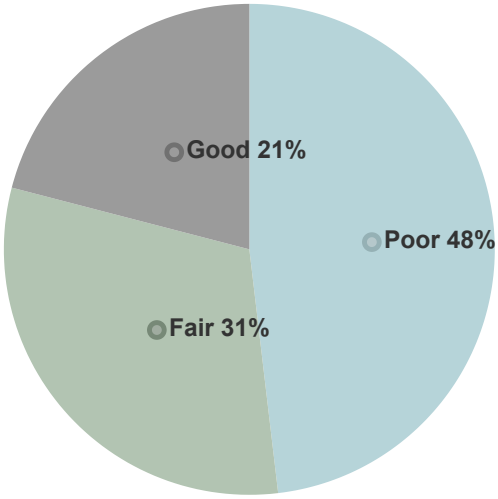
Source: **U.S. Census Bureau**, **2015-2019 American Community Survey 5-Year Estimates**

Transportation

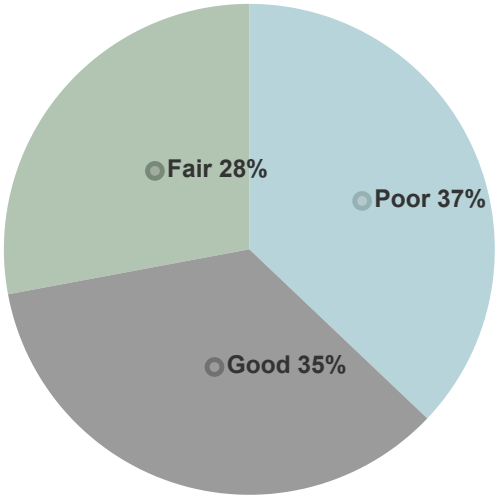
Miles of public road (including boundary roads): 339
Source: **Michigan Geographic Framework**

Pavement Condition (in Lane Miles)

Past Pavement Conditions
2007



Current Pavement Conditions
2018 - 2019

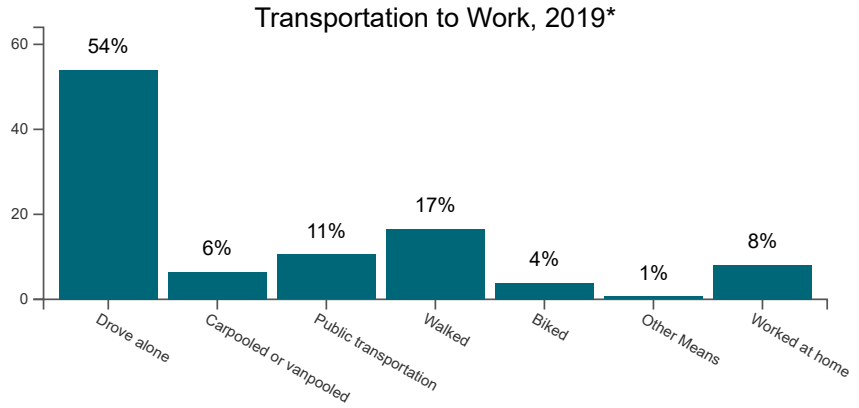


Note: Poor pavements are generally in need of rehabilitation or full reconstruction to return to good condition. Fair pavements are in need of capital preventive maintenance to avoid deteriorating to the poor classification. Good pavements generally receive only routine maintenance, such as street sweeping and snow removal, until they deteriorate to the fair condition.
Source: **SEMCOG**

Bridge Status

Bridge Status	2008	2008 (%)	2009	2009 (%)	2010	2010 (%)	Percent Point Chg 2008-2010
Open	36	97.3%	35	92.1%	46	97.9%	0.6%
Open with Restrictions	1	2.7%	3	7.9%	1	2.1%	-0.6%
Closed*	0	0%	0	0%	0	0%	0%
Total Bridges	37	100.0%	38	100.0%	47	100.0%	0.0%
Deficient Bridges	12	32.4%	16	42.1%	16	34%	1.6%

* Bridges may be closed because of new construction or failed condition.
Note: A bridge is considered deficient if it is structurally deficient (in poor shape and unable to carry the load for which it was designed) or functionally obsolete (in good physical condition but unable to support current or future demands, for example, being too narrow to accommodate truck traffic).
Source: Michigan Structure Inventory and Appraisal Database
Detailed Intersection & Road Data



* Resident workers age 16 and over

Transportation to Work

Transportation to Work	ACS 2010	% of Total (ACS 2010)	ACS 2019	% of Total (ACS 2019)	% Point Chg 2010-2019
Drove alone	32,230	58.4%	33,368	54%	-4.4%
Carpooled or vanpooled	3,821	6.9%	3,929	6.4%	-0.5%
Public transportation	4,926	8.9%	6,514	10.5%	1.6%
Walked	8,560	15.5%	10,206	16.5%	1%
Biked	1,936	3.5%	2,387	3.9%	0.4%
Other Means	405	0.7%	411	0.7%	0%
Worked at home	3,349	6.1%	4,969	8%	1.9%
Resident workers age 16 and over	55,227	100.0%	61,784	100.0%	0.0%

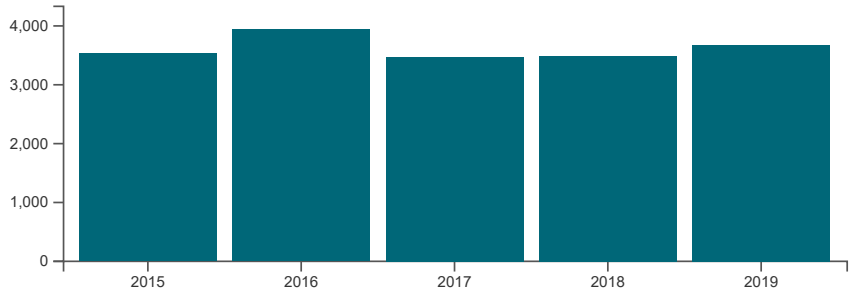
Source: **U.S. Census Bureau**, **2006-2010 and 2015-2019 American Community Survey 5-Year Estimates**

Mean Travel Time to Work

Mean Travel Time To Work	ACS 2010	ACS 2019	Change 2010-2019
For residents age 16 and over who worked outside the home	18.8 minutes	18.4 minutes	-0.4 minutes

Source: **U.S. Census Bureau**, **2006-2010 and 2015-2019 American Community Survey 5-Year Estimates**

Crashes, 2015-2019



Source: **Michigan Department of State Police with the Criminal Justice Information Center** and **SEMCOG**
Note: Crash data shown is for the entire city.

Crash Severity

Crash Severity	2015	2016	2017	2018	2019	Percent of Crashes 2015 - 2019
Fatal	4	3	4	5	3	0.1%
Serious Injury	22	28	31	27	30	0.8%
Other Injury	503	590	487	469	523	14.2%
Property Damage Only	3,001	3,318	2,949	2,985	3,120	84.9%
Total Crashes	3,530	3,939	3,471	3,486	3,676	100%

Crashes by Type

Crashes by Type	2015	2016	2017	2018	2019	Percent of Crashes 2015 - 2019
Head-on	36	26	18	28	33	0.8%
Angle or Head-on/Left-turn	739	850	679	679	718	20.2%
Rear-End	1,432	1,651	1,417	1,374	1,380	40.1%
Sideswipe	689	747	649	728	760	19.7%
Single Vehicle	438	426	446	420	483	12.2%
Backing	0	23	84	98	142	1.9%
Other or Unknown	196	216	178	159	160	5%

Crashes by Involvement

Crashes by Involvement	2015	2016	2017	2018	2019	Percent of Crashes 2015 - 2019
Red-light Running	91	98	82	71	65	2.2%
Lane Departure	330	305	363	371	448	10%
Alcohol	87	73	78	74	79	2.2%
Drugs	21	15	10	14	29	0.5%
Deer	90	73	56	55	50	1.8%
Train	0	1	0	0	0	0%
Commercial Truck/Bus	198	226	214	239	242	6.2%
School Bus	14	15	10	10	15	0.4%
Emergency Vehicle	13	21	18	19	27	0.5%
Motorcycle	27	27	21	18	23	0.6%
Intersection	1,307	1,449	1,208	1,105	1,147	34.3%
Work Zone	36	18	49	34	41	1%
Pedestrian	50	68	56	59	74	1.7%
Bicyclist	46	82	59	53	60	1.7%
Distracted Driver	0	136	268	207	229	4.6%
Older Driver (65 and older)	576	630	587	573	697	16.9%
Young Driver (16 to 24)	1,357	1,536	1,348	1,280	1,313	37.8%

High Frequency Intersection Crash Rankings

Local Rank	County Rank	Region Rank	Intersection	Annual Avg 2015-2019
1	1	4	Ellsworth Rd W @ State Rd S	66
2	5	96	State St S @ Hilton Blvd	34.8
3	10	144	Jackson Ave @ Maple Rd S	31
4	11	147	Washtenaw Ave @ Huron Pkwy S	30.8
5	14	190	Washtenaw Ave @ Glenwood Rd	28
6	15	197	Fuller Rd @ Maiden Ln	27.8
7	16	217	Washtenaw Ave @ Hill St	27
8	18	232	Packard St @ Platt Rd	26.4
9	19	253	Main St S @ Stadium Blvd E	25.6
10	21	269	Ellsworth Rd E @ Platt Rd	24.8

Note: Intersections are ranked by the number of reported crashes, which does not take into account traffic volume. Crashes reported occurred within 150 feet of the intersection.
Source: **Michigan Department of State Police with the Criminal Justice Information Center** and **SEMCOG**

High Frequency Road Segment Crash Rankings

Local Rank	County Rank	Region Rank	Segment	From Road - To Road	Annual Avg 2015-2019
1	3	78	Plymouth Rd	Barton Dr - Nixon Rd	59.2
2	6	130	Washtenaw Ave	Arlington Blvd - Huron Pkwy S	52
3	8	168	State St S	S State/W I 94 Ramp - Eisenhower Pkwy E	48
4	10	196	Washtenaw Ave	Hill St - Stadium Blvd E	45.8
5	14	250	Washtenaw Ave	Huron Pkwy S - Pittsfield Blvd	42.6
6	15	279	Ellsworth Rd E	Stone School Rd - Ellsworth Rd E	40.8
7	17	385	Packard St	State St S - Stadium Blvd E	35
8	20	432	Huron St W	7th St S - 1st St N	33.2
9	21	440	Washtenaw Ave	Stadium Blvd E - Arlington Blvd	33
10	23	466	Main St N	Depot St - Main St N	32.4

Note: Segments are ranked by the number of reported crashes, which does not take into account traffic volume.

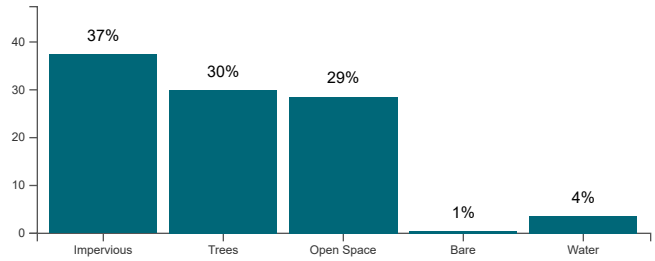
Environment

SEMCOG 2015 Land Use

SEMCOG 2015 Land Use	Acres	Percent
Single-Family Residential	5,279.4	28.8%
Multi-Family Residential	1,617.9	8.8%
Retail	492.8	2.7%
Office	753	4.1%
Hospitality	210.9	1.1%
Medical	308.8	1.7%
Institutional	1,901.8	10.4%
Industrial	276	1.5%
Agricultural	0.1	0%
Recreation / Open Space	2,461.5	13.4%
Cemetery	128.4	0.7%
Parking	68	0.4%
Extractive	0	0%
TCU	3,376.9	18.4%
Vacant	816.5	4.4%
Water	670.1	3.6%
Total	18,362.4	100%

Note: Land Cover was derived from SEMCOG's 2010 Leaf off Imagery.
Source: **SEMCOG**

SEMCOG Land Cover in 2010



Source Data

SEMCOG - Detailed Data

Type	Description	Acres	Percent
Impervious	buildings, roads, driveways, parking lots	6,864.5	37.4%
Trees	woody vegetation, trees	5,491.6	29.9%
Open Space	agricultural fields, grasslands, turfgrass	5,242.6	28.6%
Bare	soil, aggregate piles, unplanted fields	93.5	0.5%
Water	rivers, lakes, drains, ponds	670.1	3.6%
Total Acres		18,362.4	

Appendix E PUBLIC PARTICIPATION

Public Hearing Advertisement

NOTICE OF PROJECT PLAN
PUBLIC HEARING

The City of Ann Arbor, Water Treatment Services Unit will hold a public hearing on the proposed Barton Pump Station Valve Improvement project for the purpose of receiving comments from interested persons.

Due to the COVID-19 pandemic, a virtual public hearing will be held at 6 - 7 p.m. on Thursday June 3, 2021. Interested persons may use the following to attend the public hearing:

Join the electronic meeting online:
https://a2gov.zoom.us/j/91246171430?pwd=b2k0NjQwOTBMc3I5aklZQWFscU1BZz09
Passcode: 846474

Or, join by phone:
Dial 1-206-337-9723 or 888-788-0099 (Toll Free) and enter Webinar ID: 912 4617 1430

The purpose of the proposed project is to replace existing valves and piping that are critical for the reliability and operational control of Barton Pump Station. Air relief valves will also be installed on the 42-inch and 24-inch raw water pipelines. The proposed improvements are necessary to assure that a safe and reliable supply of raw source water from the Huron River is delivered to the Water Treatment Plant for treatment and distribution to the City of Ann Arbor water service area.

Project construction will involve the installation of a new valves and piping at Barton Pump Station inside the pump house building and within the adjacent site grounds. A critical sluice gate valve will be replaced in the Barton Dam Powerhouse building and new air relief valves will be installed on the 42-inch and 24-inch raw water pipelines located in Bird Hills Nature Area. This project will utilize existing water system facilities to minimize cost and maximize operational efficiency.

Impacts from the proposed project may include intermittent deliveries or construction related traffic in the vicinity of the Barton Pump Station site (1010 W. Huron River Drive, Ann Arbor, MI) along with short-term access for air relief valve installation within Bird Hills Nature Area. All construction activities would occur during daytime hours over an approximate 18-24 month period beginning July 2022.

The estimated cost to users for the proposed project will be approximately $276,894 annually for a debt repayment period of 20 years based on a total project cost of approximately $4,580,000. For the average residential customer using 18 CCFs per quarter, this will represent a 0.995% rate increase, or $3.00 annually, and a total of $60.00 over the project's 20-year debt repayment period.

Copies of the plan detailing the proposed project are available for inspection at the following location: Water Treatment Plant, 919 Sunset Road, Ann Arbor MI 48103

Applicable written comments received before the hearing record is closed on Thursday, June 3, 2021 will receive responses in the final project plan. Written comments should be sent by email to: water@a2gov.org

04/29

A2City PHN 06/03/21

NOTICE OF PROJECT PLAN PUBLIC HEARING The City of Ann Arbor, Water Treatment Services Unit will hold a public hearing on the proposed Barton Pump Station Valve Improvement project for the purpose of receiving comments from interested persons. Due to the COVID-19 pandemic, a virtual public hearing will be held at 6 - 7 p.m. on Thursday June 3, 2021. Interested persons may use the following to attend the public hearing: Join the electronic meeting online: https://a2gov.zoom.us/j/91246171430?pwd=b2k0NjQwOTBMc3I5akIZQWFs cU1BZz09 Passcode: 846474 Or, join by phone: Dial 1-206-337-9723 or 888-788-0099 (Toll Free) and enter Webinar ID: 912 4617 1430 The purpose of the proposed project is to replace existing valves and piping that are critical for the reliability and operational control of Barton Pump Station. Air relief valves will also be installed on the 42-inch and 24-inch raw water pipelines. The proposed improvements are necessary to assure that a safe and reliable supply of raw source water from the Huron River is delivered to the Water Treatment Plant for treatment and distribution to the City of Ann Arbor water service area. Project construction will involve the installation of a new valves and piping at Barton Pump Station inside the pump house building and within the adjacent site grounds. A critical sluice gate valve will be replaced in the Barton Dam Powerhouse building and new air relief valves will be installed on the 42-inch and 24-inch raw water pipelines located in Bird Hills Nature Area. This project will utilize existing water system facilities to minimize cost and maximize operational efficiency. Impacts from the proposed project may include intermittent deliveries or construction related traffic in the vicinity of the Barton Pump Station site (1010 W. Huron River Drive, Ann Arbor, MI) along with short-term access for air relief valve installation within Bird Hills Nature Area. All construction activities would occur during daytime hours over an approximate 18-24 month period beginning July 2022. The estimated cost to users for the proposed project will be approximately $276,894 annually for a debt repayment period of 20 years based on a total project cost of approximately $4,580,000. For the average residential customer using 18 CCFs per quarter, this will represent a 0.995% rate increase, or $3.00 annually, and a total of $60.00 over the project's 20-year debt repayment period. Copies of the plan detailing the proposed project are available for inspection at the following location: Water Treatment Plant, 919 Sunset Road, Ann Arbor MI 48103 Applicable written comments received before the hearing record is closed on Thursday, June 3, 2021 will receive responses in the final project plan. Written comments should be sent by email to: water@a2gov.org
04/29

AFFIDAVIT OF PUBLICATION

(Affidavit of Publisher)

STATE OF MICHIGAN,
ss.
COUNTY OF WASHTENAW

The undersigned, an employee of the publisher of Washtenaw County Legal News, having knowledge of the facts, being duly sworn deposes and says that a notice, a true copy of which is annexed hereto, was published in Washtenaw County Legal News a newspaper circulated in Washtenaw County on April 29, 2021 A.D.

Vicky Blanshard

Subscribed and sworn before me on this 29th day of April 2021 A.D.

Suzanne Ketner

Notary Public Washtenaw County, Michigan. My commission expires: October 16, 2024 Acting in Washtenaw County, Michigan.

Attorney: Office of City Clerk Ann Arbor City Notices - Jacqueline Beau
AttorneyFile#:
Notice#: 1434565

From:	Satterlee, Joanna
To:	Satterlee, Joanna
Cc:	Wiczorek, Glen; Jewison, Ken
Subject:	June 3 Public Meeting Planned for Proposed Ann Arbor Water Treatment Plant Improvement Project
Date:	Thursday, April 29, 2021 2:31:20 PM

Dear news media and community:

A public meeting and public hearing will take place Thursday, June 3, via Zoom to discuss the City of Ann Arbor Water Treatment Plant proposed Barton Pump Station Valve Improvement Project. Please see the news release, below and online at https://www.a2gov.org/news/pages/article.aspx?i=789, for details.

We hope you will share this information with your audience.

Thank you for your consideration,

Joanna E. Satterlee

City of Ann Arbor | Communications Manager | Larcom City Hall · 301 E. Huron St., Third Floor · Ann Arbor · MI · 48104

734.794.6110, extension 41105 (O) | jesatterlee@a2gov.org | www.a2gov.org | www.facebook.com/thecityofannarbor | http://twitter.com/a2gov

A2 Be Safe. Everywhere. Everyone. Every day.
a2gov.org/A2BeSafe

PRESS RELEASE

For Immediate Release

City Contact: Glen Wiczorek, PE, Senior Utilities Engineer, 734.794.6426, ext. 43958 | gwiczorek@a2gov.org
Project Contact: Ken Jewison, PE, Stantec, 734.892.9041 | ken.jewison@stantec.com

June 3 Public Meeting will Outline Proposed Ann Arbor Water Treatment Plant Improvement Project

ANN ARBOR, Michigan, April 29, 2021 — An improvement project is being proposed for the City of Ann Arbor Water Treatment Plant that will assure delivery of a safe and reliable supply of raw source water from the Huron River to the plant for treatment then for distribution to water service customers. The project would consist of replacing existing valves and piping that are critical for the reliability and operational control of the Barton Pump Station. Air relief valves would also be installed on the 42-inch and 24-inch raw water pipelines. A public meeting to explain the project in greater detail, along with a public hearing, will take place online 6–7 p.m. Thursday, June 3, 2021, via Zoom. To access at the time of the meeting:

- Visit https://a2gov.zoom.us/j/91246171430?pwd=b2k0NjQwOTBMc3I5aklZQWFscU1BZz09.
    - Enter passcode: 846474
- Or join by phone: dial 1-206-337-9723 or 888-788-0099 (toll free) and enter webinar ID:

912 4617 1430.

This project will use existing water system facilities to minimize cost and maximize operational efficiency. The estimated cost for the average residential water customer using 18 CCFs (centum cubic feet) per quarter would represent a 0.995% rate increase, or $3 annually, and a total of $60 over the project's 20-year debt repayment period. The proposed project cost would be approximately $276,894 annually for a debt repayment period of 20 years, based on a total project cost of approximately $4,580,000.

Adjacent neighborhood impacts from the proposed project may include intermittent deliveries or construction-related traffic in the vicinity of the Barton Pump Station site (1010 W. Huron River Drive in Ann Arbor) along with short-term access for air relief valve installation within Bird Hills Nature Area. All construction activities would occur during daytime hours over approximately 18-24 months, beginning July 2022.

Copies of the proposed project plan are available for inspection at the Ann Arbor Water Treatment Plant, 919 Sunset Road, Ann Arbor MI 48103. To provide feedback outside of the public meeting, please submit, in writing, by email to water@a2gov.org. Applicable written comments received before the hearing record is closed, on Thursday, June 3, 2021, will receive responses in the final project plan.

# # # # #

Public Hearing Transcript

CITY OF ANN ARBOR DWSRF PUBLIC HEARING

RE: BARTON PUMP STATION VALVE IMPROVEMENT PROJECT

Remote public hearing
June 3, 2021,
About 6:00 p.m.

MS. STILLWAGON: Thank you to everyone who is joining us this evening. We welcome you to the Barton Pump DWSRF project plan meeting. You will see on the slide in front of you an overview of the technology and important things to know. Your video cameras and screen share option are disabled. All attendees are muted. You can leave and rejoin the meeting as you please. And you'll be able to ask questions at the end of the presentation. We will begin shortly.

All right it is now 6:00 and we will begin our meeting. Please welcome Ken Jewison from Stantec. He'll be giving the presentation this evening and I will hand it over to Ken.

MR. JEWISON: Thanks, Stephanie. Welcome ladies and gentlemen. Appreciate you joining us on such a lovely evening for the Drinking Water State Revolving Fund project plan public hearing. This is for the Barton Pump Station valve improvement project for the city of Ann Arbor. I'm going to start with my video on but I will probably turn that off here in a little bit. My name is Ken Jewison. I'm a project manager in the

water group for Stantec, and Stantec is a consulting engineer for the city of Ann Arbor on this project. This is our agenda for the meeting this evening. We'll talk just briefly on the project team and have some introduction on both the technology of the Zoom meeting, safety moment, and then we'll have a brief overview of the state revolving fund program for drinking water systems, talk about the background and project need, speak to the alternatives and the analysis that was done related to those, the improvements that are planned, the project impacts related to implementing the project, financing and user costs, talk about the project schedule, and then we will have an opportunity for questions following the presentation.

So the project team with you this evening is myself. It's a younger picture of me. Stephanie Stillwagon who's administrative assistant for the city. We also have Greg Schofer who's an associate level engineer for Stantec, and Brian Steglitz who's the water treatment services manager for the city of Ann Arbor. So since this is a Zoom meeting I'll just briefly go over a few expectations. The meeting started on time. We intend to end on time by 7:00 and we would ask that you raise your hand to be recognized to talk. We'll have one speaker at a time and when you do that please

move to a quiet area, silence any background sounds and since this is a public hearing we do have a court recorder to prepare a transcript and we would ask that you state your name and address for the record, speak loud and clear, and everyone will get a chance to speak before we have repeat speakers. So certainly be respectful and try to differentiate I suppose in particular with comments between facts and opinions; and then just a reminder that any inappropriate written or verbal comments, language, personal attacks, that sort of thing, would result in the participant being removed from the meeting.

This is a technology overview. There's a couple ways that folks could join. I think primarily they may be on the computer. There's also an opportunity to join by phone, so you can raise your hand and we will call on you. Again, this would be at the end of the presentation. In the interim there is also the opportunity to type in questions or even if they're not questions perhaps comments that you might have could be submitted in that fashion, and then we will return to the slide at the end of the presentation and go over those instructions one more time.

So at Stantec we like to start most of our significant meetings or events with a safety moment. It

is -- summer's in full force now. Everybody's anxious and happy for that and I know the city of Ann Arbor in particular with U of M present is a very active community, so I thought an appropriate topic would be bicycle safety especially with the pandemic there's a lot of folks getting involved with active pursuits that they didn't have before the pandemic; so this may be old news to some of you and may be helpful reminders for others but when you're cycling certainly wear a helmet and proper footwear. Ride defensively, focused and alert. Obey signs and signals. Bicycles have to follow and obey the same rules as cars do in the roadways. Be visible; during the day wear bright clothing and wear reflective clothing if you need to ride at night. Look ahead for hazards and avoid the classic distractions we have now with texting or cell phone use, even if it is hands free, and then certainly avoid alcohol and drug use when you're riding.

So what is the Drinking Water State Revolving Fund and why are we here tonight? The DWSRF is a low interest loan program that's designed to assist community water supplies to meet Michigan's safe drinking water act requirements. And this funding can be used for planning, design, engineering, and construction for water system improvements. The current

20-year interest rate is 1.875 percent. And the project plan is the first step in the funding process, so it's really the primary purpose of the hearing tonight. One of the expectations for funding is to provide public participation and the project plan has been available for public review and comment for the last 30 days and the public hearing is the final step in that process.

So projects that apply for the Drinking Water State Revolving Fund they're ultimately awarded funding based primarily on what's called a project priority listing so the Michigan Department of Environment, Great Lakes, and Energy, EGLE -- it used to be DEQ -- will score and rank the applications based on a number of factors. Some of them have to do with the population served by the community water system, what the problems are, and how serious they are. Do they have drinking water contamination for say arsenic for example? And the other primary consideration is the availability of federal and state funds. That varies from year to year. Some years anyone who applies as a community water supply receives funding and other years it's fairly compensative, and that just depends on how much federal and state funds are available.

A little bit on the project background. Barton Pump Station is 70 years old. And serves as

critical water supply infrastructure for the city. The station has a 40 million gallon per day pumping capacity. There's five pumps so when you take the largest pump out of service, that's what firm capacity means. And the station supplies 85 percent of the source water that's withdrawn from the Huron River to the city's water treatment plant. The balance of that is made up by the city's ground water source from their well field but the vast majority comes from the Huron River and the Barton Pump Station is the way that that water makes it to the water treatment plant. And that occurs, there's two parallel raw water transmission mains that convey water from the pump station up to the water treatment plant.

So why is this project necessary? There are, you know, aside from the pump station being 70 years old there are large sections of piping within the station that date to the original time of construction. Significant portions of that piping are corroded, which certainly has the potential to compromise the structural integrity of that piping; and the real heart and core of the project is there a large number of valves within that pump station that are broken, they're inoperable or they're leaking or a combination of all three of those things. And those are very critical for the station's

ability to isolate certain pumps and provide redundancy and reliability within the station in providing raw source water to the water treatment plant. So in many cases that redundancy is limited or it simply doesn't exist.

This slide really speaks to emphasizing or illustrating the need for the project. The picture on the right is a section of the 24-inch diameter raw water transmission main from a break that occurred in November of 2017; and so when this event happened the city, you know, because of the inoperable valving and the lack of control within the station for that, the city was unable to isolate the 24-inch main from the parallel 42-inch main and that resulted in the need to temporarily shut down water supply to the waste water treatment plant -- or to the water treatment plant, excuse me, from Barton Pump Station; and the city because of that had to plan for potential water restrictions and go into an emergency response and repair mode to repair that break as soon as possible because that lack of redundancy.

Fortunately, this occurred in November. Had it occurred in the summertime when there's a significantly higher water use, maybe those restrictions would have been necessary. So the pipe capacity also as a part of this event was impacted by trapped air after

the repairs were completed and we'll touch on that in a bit.

So as part of the project plan expectations from EGLE, there's a guidance document, and each community water supply when they apply for revolving fund loan they need to evaluate three key alternatives. One is the no action or do nothing alternative. One is reviewing the existing facilities and is there a way to optimize performance or maybe make some enhancements that could address the problems that the water supply is having, and the other is looking at a regional system alternative. And in this particular case, you know, this project is more of an immediate need. The slides previous with the water main break that occurred in 2017 really serve to illustrate that but the no action alternative wasn't deemed responsible as a water supplier to really do nothing and nor the issues that need to be addressed. And similar with the regional system alternative looking at regional supplies, I mean, the city of Ann Arbor already is in essence a regional supplier of water and to look at regional supply is a more of a long-term, multiple year process and it would not serve to address the immediate needs of critical infrastructure. So what the project plan focused on was honing in on really in essence replacing infrastructure

that simply has served its useful life or is beyond its useful life, and that became the principal. And the selected alternative within the project plan, which was in essence to optimize the existing facility by replacing those valves and piping that the time has come for.

So this slide speaks to the majority of the project which will occur at the Barton Pump Station site. There are approximately 30 valves that need to be replaced along with the associated piping. This slide highlights, you know, a few of those key valve locations. One of them there's a picture of the Barton Dam Powerhouse here on the right. There's a large sluice gate in there that needs to be replaced that's leaking that is critical to control of replacing the remainder of the valves at the station. And then of course replacing those valves and associated piping within the pump station, which is a significant component of the work.

And exterior to the building there's also new isolation and control valves on 36-inch raw water supply line from the Powerhouse structure and Barton pond into the pump station and then the two parallel transmission mains large valves need to be replaced on the 24-inch and the 42-inch transmission mains to the

water treatment plant.

A minor aspect of this is to regrade and top dress the facility entrance drive and a key point I suppose to make too with this is that these improvements need to be very closely coordinated because this is a critical infrastructure facility; it needs to stay in operation throughout the project so the sequencing of when these valves, which valves get installed is crucial to the success of the project, and that's a key aspect of what's occurred to date with the planning and engineering behind the project plan.

So as a part of this project the city elected to also address a real need on the two raw water transmission mains. There's a 42-inch Prestressed Concrete Cylinder Pipe, that's PCCP, and that was installed in 1965 and then there's the 24-inch cast iron main that was installed in 1949. Both of these serve as critical infrastructures similar to the pump station and they convey that raw source water from the Huron River from Barton Pump Station up to the water treatment plant. And the air release valves or ARVs are included in this Drinking Water State Revolving Fund project plan. The ARVs remove trapped air and prevent a vacuum condition from occurring within these transmission mains and in essence they assure that source water supply

capacity can be met. Trapped air really serves to significantly or can significantly reduce the capacity of those pipes to convey water from one point to another, and without ARVs that trapped air is very difficult to remove. So the current conditions as they are now there's three ARVs on the 42-inch main. All of these are either leaking or inoperable and the 24-inch main that was installed in 1949 air release valves were not installed on that main. So as part of this project the city seeks to basically install three new air release valves on the 24-inch main and provide this critical support function on the main that doesn't have it at all right now. And then replace the three existing ARV that are on the 42-inch main. And then another minor component would be to repair the -- there's a leaking corporation on the 42-inch main.

So the project plan is expected to address, identify and address any potential social and environmental impacts. So for this project there will be some intermittent construction traffic on Huron River Drive, which is the main street that they would access, contractors and those folks that are working at the site, access the Barton Pump Station facility. There would be soil erosion control measures that would be installed at the Barton Pump Station site for that work

that's exterior to the building, and then also within the Bird Hills Nature Area that would be very limited but focused around those air release valve locations. There will be some, you know, typical noise and dust associated with construction activities, which would be limited to daytime working hours in accordance with the city standards; and then because of the age of that station there is the potential for lead-based paint or asbestos materials to be encountered so the, you know, contract documents would specify that the contractor follow OSHA abatement requirements if those are indeed encountered with the construction work.

For the ARVs there would be construction access with equipment to get back in through the nature area to those specific ARV installation locations, and those exact routes would be determined here in the upcoming detailed design phase. The overall construction timeline for the project at Barton Pump Station that's estimated at 18 to 24 months and then for the ARVs in the Bird Hills Nature Area it's a much smaller endeavor and shorter or smaller location, that would be approximately six to eight weeks.

The total project cost is estimated at 4.6 million and at the current 1.875 percent interest rate for a 20-year loan, that results in an annual debt

retirement of approximately $277,000, which results in a rate increase of just below one percent which results in a $3 per year rate increase for the average residential customer of the city surface area right now.

And this slide presents the project schedule. The major events on the left, there's a lot more events that need to happen but this really just kind of highlights the major components. The expectation would be to complete final design by December of this year and then receive bids and award the project in April of 2022. Proceed with the loan closing through EGLE and that would occur spring of 2022 and then the start of construction at the Barton Pump Station is scheduled right now for July of 2022 to begin. The following year the ARVs would be replaced within the nature area, and then currently the estimated completion date for construction is March of 2024.

And that concludes my presentation. On behalf of the city we appreciate your attendance and now I will hand it back to Stephanie and we will facilitate any questions that you may have regarding this project.

MS. STILLWAGON: Thank you, Ken. Yes we're at the question and answer portion of our presentation, so I just wanted to do like a quick technology overview. If you're using a computer and you'd like to ask a

question, please click the hand icon and normally that's located on the bottom of your screen. If you're using your phone and you'd like to ask a question, please hit star 9 and then I'll identify you by the last three digits of your phone number. And you'll just have to hit star 6 to un-mute yourself. And then you may also ask a question or give feedback using the Q and A icon at the bottom of your screen. So we can begin if anybody has any questions, just please raise your hand. So I don't see anybody asking any questions. Oh we do have one question here. Bill. Bill, I'll go ahead and allow you to talk just please un-mute yourself.

BILL: Can you hear me?

MS. STILLWAGON: We can.

MR. JEWISON: We can, yes.

BILL: All right. Good presentation.

MR. JEWISON: Thanks Bill.

BILL: On the intake raw water to the Barton Pump Station you mentioned the sluice gate at the upstream end of the 36-inch raw water line. Did you also mention another valve being added or replaced in the 36-inch line before it gets to the pump station or in the station?

MR. JEWISON: Yes. There was another valve on that 36-inch line exterior to the building that would

be within the site of the Barton Pump Station site. Whereas that sluice gate is within the Barton Dam Powerhouse structure.

BILL: But the valve that's in there -- there is a valve already there and you're going to replace it?

MR. JEWISON: Yes within -- yes, the Barton Dam Powerhouse structure, correct. Is that what you meant, Bill?

BILL: No, I'm not talking about the sluice gate.

MR. JEWISON: Okay.

BILL: There was another valve in the yard near the pump station.

MR. JEWISON: Yes.

BILL: Is that being replaced?

MR. SCHOFER: That would be correct. The yard valves for isolation purposes will be replaced as part of this project.

BILL: May I ask a second question on the same subject, please?

MR. JEWISON: Sure.

BILL: The other line from the pond, the 20-inch has a valve in the first bay of Barton Dam, everybody knows that. Is there another valve between

there and the pump station and if so, are you going to replace it or if not, are you going to add one?

MR. SCHOFER: One second please. I just want to verify something before I respond.

BILL: Okay.

MR. JEWISON: Yeah thanks, Bill. This is getting into the weeds a little bit and Greg certainly is more intimate to these portions of the project than myself so but very, very good questions.

BILL: Sorry I'm a get-into-the-weeds kind of guy.

MR. JEWISON: Well I can tell this isn't the average, you know, high level question that's for sure so.

MR. STEGLITZ: Well Bill has a few years experience with the city so we have to cut him some slack.

MR. JEWISON: Oh okay. He has inside knowledge is that --

MR. STEGLITZ: He does. How are you Bill? Nice to hear from you.

BILL: I'm fine thank you.

MR. SCHOFER: That is correct. And the inner connection valve between the two feeder pipes will be replaced; the interconnect valve also would be

replaced, so all three of those valves are scheduled to be replaced as part of this project.

BILL: Okay. Thank you very much. I'm glad you're doing that. It sound pretty neat.

MR. JEWISON: Yeah thanks, Bill. Appreciate the questions.

BILL: You're welcome. Bye bye.

MR. JEWISON: Bye.

MS. STILLWAGON: Thank you, Bill. And does anybody else have any questions? If nobody else has any questions, we can close our, you know, question and answer portion of the presentation. And that would conclude our presentation. Ken, are you all set?

MR. JEWISON: Yeah. Thanks everyone for joining. I really appreciate it.

MS. STILLWAGON: Thank you. And have a nice evening.

(Public hearing concluded at 6:27 p.m.)

STATE OF MICHIGAN)
)
COUNTY OF WASHTENAW)

CERTIFICATE OF NOTARY PUBLIC AND COURT REPORTER

I, Caitlyn Hartley, do hereby certify that the foregoing public hearing was duly recorded by me stenographically and by me later reduced to typewritten form by means of computer-aided transcription; and I certify that this is a true and correct transcript of my stenographic notes so taken.

I further certify that I am neither of counsel to either party nor interested in the event of this cause.

Caitlyn Hartley, RPR, CSR-8887
Notary Public,
Washtenaw County, Michigan
My Commission expires: August 15, 2021

$

$277,000 14:1

$3 14:3

1

1.875 6:1 13:24

18 13:19

1949 11:17 12:8

1965 11:16

2

20-inch 16:24

20-year 6:1 13:25

2017 8:10 9:14

2021 2:2

2022 14:11,12,14

2024 14:17

24 13:19

24-inch 8:8,13 10:25 11:16 12:7,11

3

3 2:2

30 6:6 10:9

36-inch 10:21 15:20,22,25

4

4.6 13:23

40 7:2

42-inch 8:13 10:25 11:14 12:6, 14,16

6

6 15:6

6:00 2:3,14

6:27 18:18

7

70 6:25 7:16

7:00 3:23

8

85 7:5

9

9 15:4

A

abatement 13:11

ability 8:1

access 12:21,23 13:14

accordance 13:6

act 5:23

action 9:7,15

active 5:3,6

activities 13:5

add 17:2

added 15:21

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Public Hearing Contents

Welcome!

The Public Hearing Will Begin Soon

Technology Overview – Things to Know

- Attendee video cameras are disabled (we can't see you)
- Attendee screen share is disabled
- All attendees are muted (instructions to unmute will be covered)
- You can leave and rejoin the meeting at any time (unless you are removed for inappropriate behavior)
- An opportunity for questions will follow the slide presentation
- ***Please use this time to complete an optional, anonymous demographic questionnaire available through Zoom polling.***

Stantec

City of Ann Arbor
Thursday, June 3, 2021

DWSRF Public Hearing

Barton Pump Station Valve Improvement Project

Meeting Agenda

1. Project Team
2. Introduction & Safety Moment
3. DWSRF Program Overview
4. Background & Project Need
5. Alternatives Analysis
6. Planned Improvements
7. Project Impacts
8. Financing & User Costs
9. Project Schedule
10. Questions

Project Team - Public Hearing Speakers

Stephanie Stillwagon
City of Ann Arbor
Administrative Assistant

Ken Jewison, PE
Stantec
Project Manager

Zoom Meeting Norms

- Start on time . . . end on time.
- Raise your hand to be recognized to talk; one speaker at a time
- Move to a quiet area and silence any background sounds when speaking
- State your name and address for the Public Hearing transcript
- Speak loud and clear so everyone can hear
- Everyone will be provided a chance to speak before a repeat speaker
- Be respectful of other ideas and perspectives – no finger pointing!
- Try to differentiate between I know (facts) and I think (opinions).
- Inappropriate written and/or verbal comment or language, including personal attacks and accusations, will result in the attendee being removed from the meeting

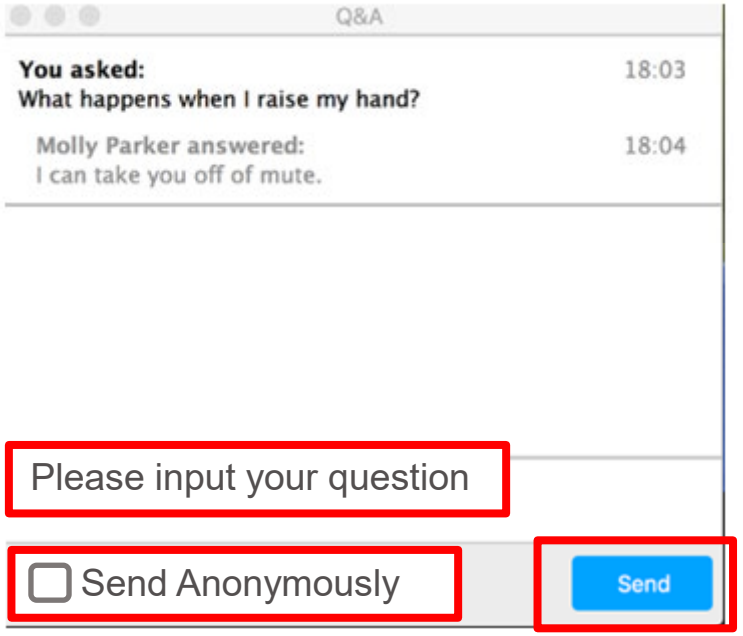
Technology Overview
Ask a Question/Share a Comment

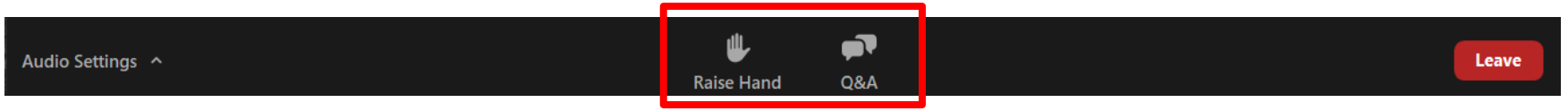
Note: When you raise your hand, the host will enable your microphone. The host will disable your microphone after your question.

Computer

- **Raise Hand**
  - You will be identified by the name provided when you entered the meeting
  - **Lower Hand** if needed

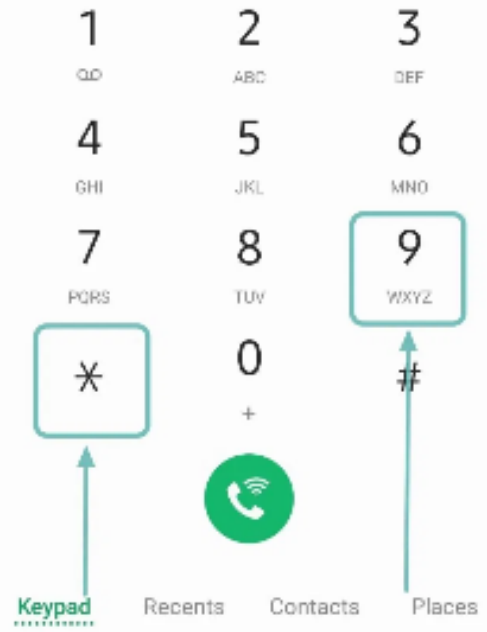
- **Q&A**
  - Type your question
  - Check **Send Anonymously** if you do not want your name to be publicly visible with your Question
  - Click **Send**





Phone

- Select *9 to raise your hand
- You will be identified by the last 3 digits of your phone number

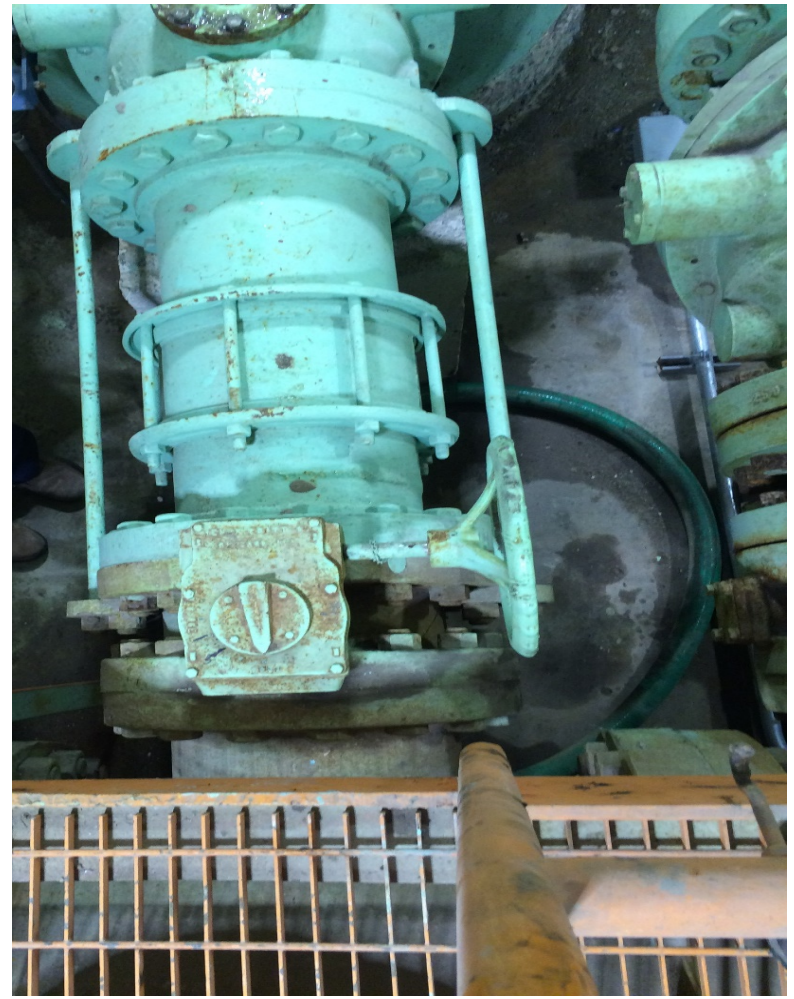


Safety Moment – Bicycle Safety

- Wear a helmet and proper footwear
- Ride defensively, focused and alert
- Obey signs/signals, same rules as cars
- Be visible, wear bright/reflective clothing
- Look ahead for hazards, no texting
- Avoid alcohol and drug use

Drinking Water State Revolving Fund DWSRF

- Low-interest loans assist community water supplies to meet Michigan's Safe Drinking Water Act requirements.
- Funding can be used for water system improvement planning, engineering design and construction.
- Current 20-year interest rate is 1.875%
- A DWSRF Project Plan is first step in funding process.
- Projects are awarded funding based on:
  - Project Priority Listing – EGLE Ranking
  - Availability of Federal/State Funds



Project Background

- Barton Pump Station is 70 years old
- Critical water supply infrastructure
- 40 MGD firm pumping capacity
- Supplies 85% of source water from the Huron River to the City's WTP
- 24" & 42" raw water transmission mains

Project Need

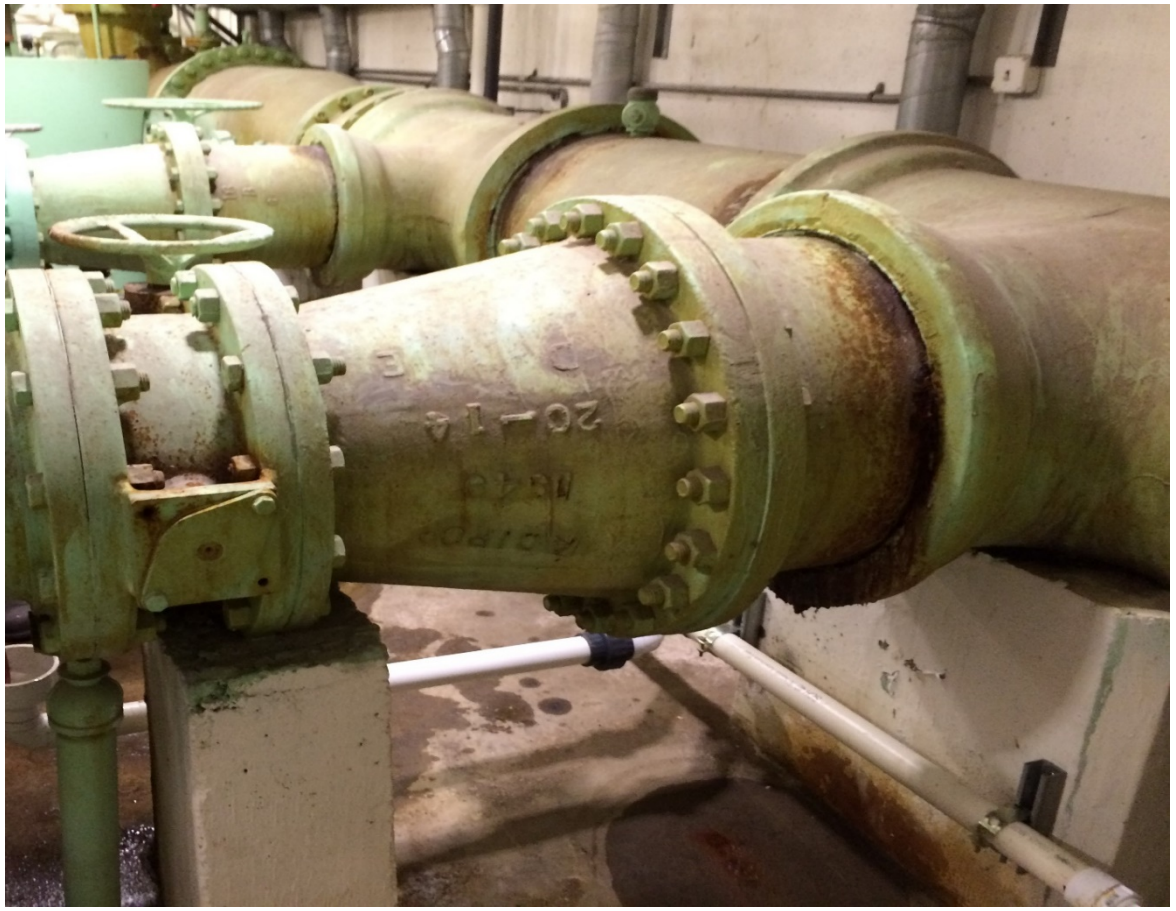
- Large sections of piping date to the original pump station construction
- Corroded piping
- Broken, inoperable and leaking valves
- Ability to isolate and provide redundancy is limited or does not exist

Project Need

- 24” Transmission Main Break in November 2017
- Unable to isolate 24” main from the adjacent 42” main
- Temporarily shut-down water supply to City’s WTP
- Pipe capacity impacted by trapped air after repairs were completed

Analysis of Alternatives

- EGLE DWSRF Project Plan Guidance
- No-Action Alternative
- Optimum Performance of Existing Facilities
- Regional System Alternative
- Principle & Selected Alternative
- Optimization of Existing Facility



Barton Pump Station Valves & Piping

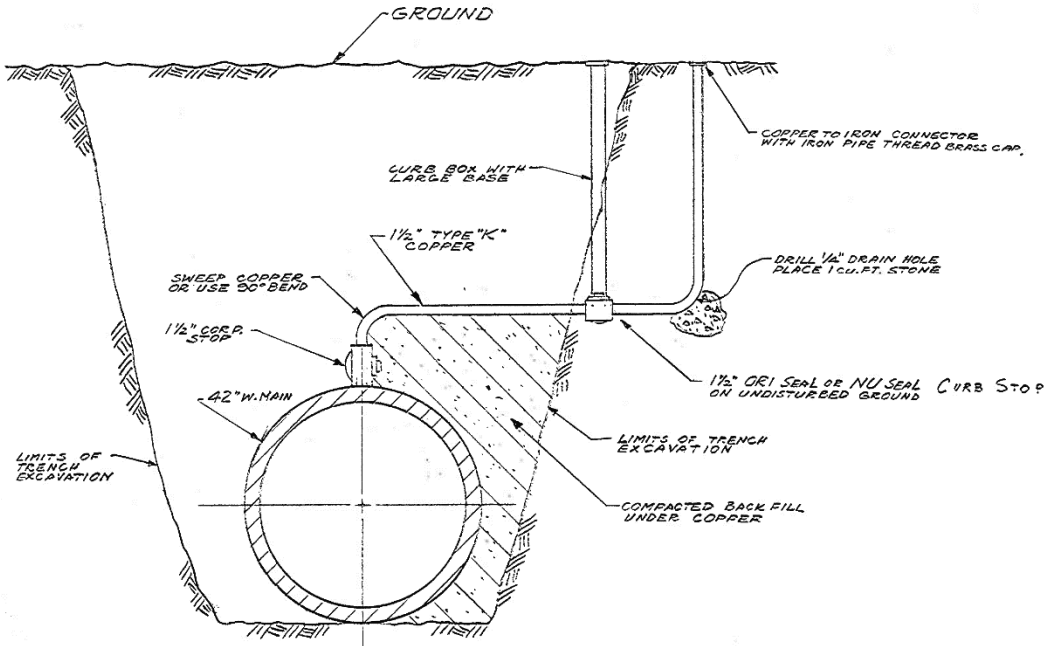
- Replace 36”x72” sluice gate at Barton Dam Powerhouse
- Replace valves & associated piping in Barton Pump Station
- Install new isolation/control valves on 36” raw water supply and the 24”/42” discharge piping external to pump house
- Regrade and top dress facility entrance drive
- Improvements must be closely coordinated to keep pump station operational throughout entire project

Raw Water Transmission Mains

- There are 2 raw water transmission mains:
  - 42” PCCP main constructed in 1965
  - 24” CI main installed in 1949
- Serve as critical source water infrastructure
- Supply Huron River water from Barton Pump Station to the City’s Water Treatment Plant
- Air release valves (ARVs) are included in the DWSRF Project Plan

Transmission Main ARVs

- ARVs remove trapped air and prevent a vacuum
- Assure source water supply capacity can be met
- 3 ARVs on 42” main are leaking or inoperable
- ARVs were not installed on 24” main
- 3 new ARVs on 24” main, replace 3 ARVs on 42” main
- Repair leaking corporation on 42” PCCP main



AIR RELIEF ASSEMBLY DETAIL
NO SCALE

Social & Environmental Impacts

- Intermittent construction traffic on Huron River Drive
- Soil Erosion Control Measures at Barton Pump Station and in Bird Hills Nature Area
- Noise & Dust – Daytime work hours only
- Lead-based paint or asbestos – Follow OSHA abatement requirements

Social & Environmental Impacts

- Construction access routes to ARV sites in Bird Hills Nature Area
- Exact routes determined in detailed design phase
- Construction Timeline:
  - Barton Pump Station = 18 to 24 months
  - ARVs in Bird Hills NA = 6 to 8 weeks

Leaking Air Release Point on 42” Main

Project Financing & User Costs

- $4.6 Million Total Project Cost
- 1.875% Interest Rate for 20-Year Loan
- 0.995% Rate Increase
- $277,000 Annual Debt Retirement
- $3.00 per year rate increase for average residential customer

DWSRF Project Schedule

MAJOR PROJECT EVENT	APPROXIMATE DATE
Completion of Final Design	December 2021
Construction Bids Received	March 2022
City Council Contract Award	April 2022
DWSRF Loan Application and Closing	April to June 2022
Start of Construction at Barton Pump Station	July 2022
Bird Hills Nature Area Access for ARV Replacements	June 2023
Construction Complete	March 2024

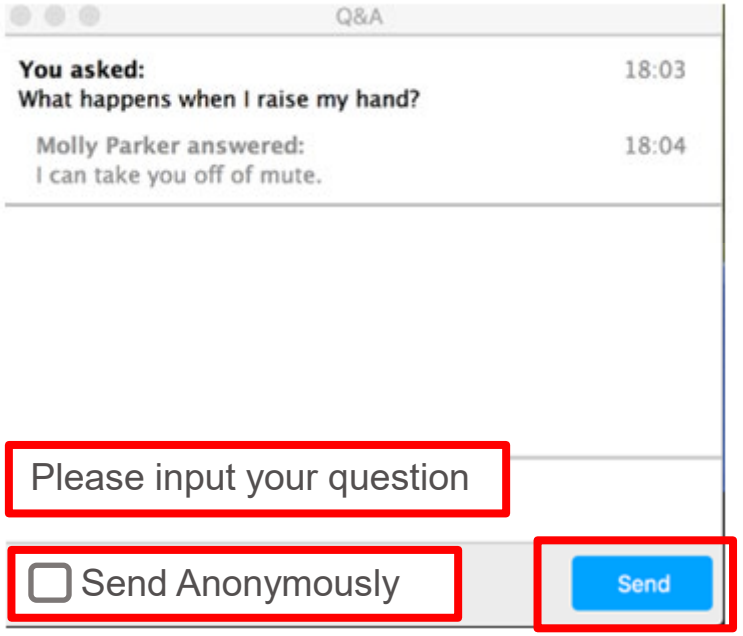
Questions and Answers

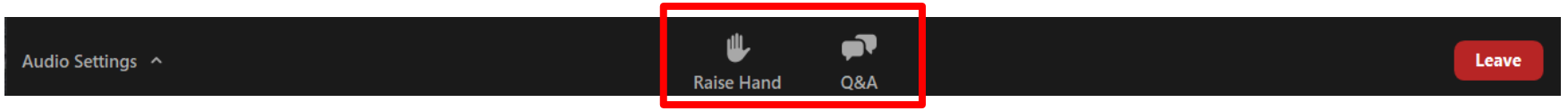
Note: When you raise your hand, the host will enable your microphone. The host will disable your microphone after your question.

Computer

- **Raise Hand**
  - You will be identified by the name provided when you entered the meeting
  - **Lower Hand** if needed

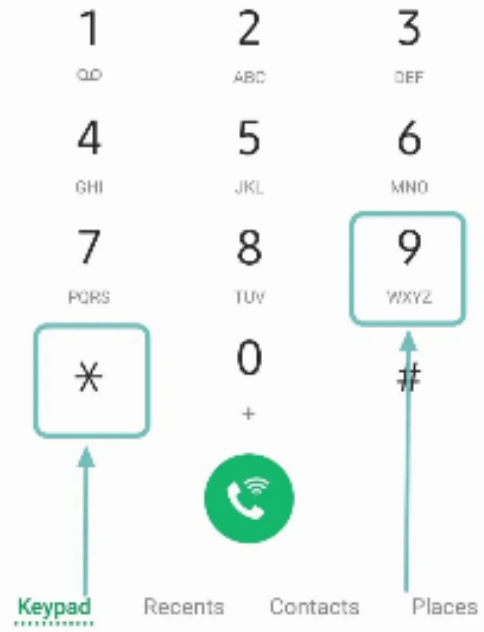
- **Q&A**
  - Type your question
  - Check **Send Anonymously** if you do not want your name to be publicly visible with your Question
  - Click **Send**





Phone

- Select *9 to raise your hand
- You will be identified by the last 3 digits of your phone number



Comments Received and Answered

Attendee Report										
Report Generated:	6/4/2021 8:19									
Topic	Webinar ID	Actual Start Time	Actual Duration (minutes)	# Registered	# Cancelled	Unique Viewers	Total Users	Max Concurrent Views		
Barton Pump Station Valve Improvement Project Public Hearing	912 4617 1430	6/3/2021 17:06	90	6	0	6	14	0		
Host Details										
Attended	User Name (Original Name)	Email	Join Time	Leave Time	Time in Session (minutes)	Country/ Region Name				
Yes	Kayla Coleman	kcoleman@a2gov.org	6/3/2021 17:06	6/3/2021 17:38	33	United States				
Yes	Kayla Coleman	kcoleman@a2gov.org	6/3/2021 17:36	6/3/2021 17:36	1	United States				
Panelist Details										
Attended	User Name (Original Name)	Email	Join Time	Leave Time	Time in Session (minutes)	Country/ Region Name				
Yes	Ken Jewison	Ken.Jewison@stantec.com	6/3/2021 17:26	6/3/2021 18:35	70	United States				
Yes	Stephanie Stillwagon	sstillwagon@a2gov.org	6/3/2021 17:31	6/3/2021 18:35	64	United States				
Yes	Brian Steglitz	bsteglitz@a2gov.org	6/3/2021 17:54	6/3/2021 18:27	34	United States				
Yes	Kayla Coleman	kaylacoleman@gmail.com	6/3/2021 17:40	6/3/2021 17:43	3	United States				
Yes	Greg Schofer (Greg)	greg.schofer@stantec.com	6/3/2021 17:36	6/3/2021 18:35	59	United States				
Attendee Details										
Attended	User Name (Original Name)	First Name	Last Name	Email	Registration Time	Approval Status	Join Time	Leave Time	Time in Session (minutes)	Country/ Region Name
Yes	Bill	Bill		wrwheeler46@gmail.com	6/3/2021 18:05	approved	6/3/2021 18:05	6/3/2021 18:35	31	United States
Yes	Kevin J Love	Kevin	J Love	kjlove@umich.edu	6/3/2021 17:42	approved	6/3/2021 17:42	6/3/2021 18:27	45	United States
Yes	OhDell	OhDell		na@na.com	6/3/2021 17:55	approved	6/3/2021 17:55	6/3/2021 18:27	33	United States
Yes	Vanessa Kiefer	Vanessa	Kiefer	vkiefer@umich.edu	6/3/2021 17:58	approved	6/3/2021 17:58	6/3/2021 18:27	30	United States
Yes	Caitlyn Hartley-reporter	Caitlyn	Hartley-reporter	cimdreamer@gmail.com	6/3/2021 17:43	approved	6/3/2021 17:43	6/3/2021 18:28	45	United States
Yes	Kayla Coleman	Kayla	Coleman	kaylacoleman@gmail.com	6/3/2021 17:38	approved	6/3/2021 17:38	6/3/2021 17:40	2	United States
Other Attended										
User Name	Join Time	Leave Time	Time in Session (minutes)	Country/Region Name						
12485349160	6/3/2021 18:18	6/3/2021 18:27	10	United States						

Question Report				
Report Generated:	6/4/2021 8:21			
Topic	Webinar ID	Actual Start Time	Actual Duration (minutes)	# Questions
Barton Pump Station Valve Improvement Project Public Hearing	912 4617 1430	6/3/2021 17:06	90	4
Question Details				
#	Question	Asker Name	Asker Email	Answer(s)
1	Looks like it works! I can see the screen and hear the audio. Do you see my name as an attendee?	Kayla Coleman	kaylacoleman@gmail.com	I do. Should I try and promote you
2	screen and speaking	Kevin J Love	kjlove@umich.edu	thank you
3	This is the court reporter. I can see everything fine.	Caitlyn Hartley-reporter	cimdreamer@gmail.com	live answered
4	Thorough presentation, thank you.	Kevin J Love	kjlove@umich.edu	live answered