Project Planning Document

Water System Improvements Drinking Water Project Planning Document

DWSRF Project No. XX-XX

Prepared for City of Bronson

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1 EXECUTIVE SUMMARY

The City of Bronson (City) owns and operates a public water supply consisting of two treated groundwater wells, one elevated storage tank, and a distribution system that serves approximately 1.4 square miles and an estimated population of 2,349 (2022 estimate). The water system has operated reliably without any health-based violations in the last five years. By completing a Water System Reliability Study (WSRS, Appendix A), Asset Management Program and Capital Improvement Plan (AMP/CIP, Appendix B), and updates to the Capital Improvement Plan (Appendix C), the City has prioritized the following water system improvements for completion in the next five years:

- a. Lead Service Line Replacements
- b. Under Sized Water Main Replacements

The purpose of the Project Planning Document (PPD) is to demonstrate the needs for the 20-year period, conduct alternatives analysis, estimate project costs, conduct environmental evaluations, and include the public in the planning process. This PPD is prepared on behalf of the City of Bronson, Branch County, Michigan, for the purpose of obtaining a Drinking Water State Revolving Fund (DWSRF) loan from the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE) for the construction of improvements to the City of Bronson water system.

A summary of recommended projects to fill the project need is shown on Figure 1 and summarized in Table 3.

2 INTRODUCTION

The City is located in Branch County. The City consists of a mix of residential, commercial, and industrial properties. The City water system is supplied by two existing wells located in Bronson Township, with a firm capacity of 1.08 million gallons per day (mgd).

The existing water distribution system contains approximately 18 miles of water main with variety of age, size, and material. Half of the distribution system is comprised of either 4-inch or 6-inch water main and was installed prior to 1970.

The presence of lead service lines is likely, particularly for customers connected to older water main. The City has made concerted efforts in recent years to replace aging water main including replacing lead service lines and wishes to continue this work utilizing DWSRF funds.

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Specifically, the City has prioritized areas of undersized cast iron water mains that are beyond their design life. The selection of projects was determined by the 2023 WSRS, 2019 AMP and CIP, and the 2022 updates to the CIP.

2.1 Study Area Characteristics

2.1.1 Delineation of Study Area

The service area of the City of Bronson water system is confined within the extent of the City incorporated boundary and is shown in Figure 1. No new areas of service are anticipated in the next 20-years; however, growth within the area of service is expected.

2.1.2 Land Use

The current Zoning Map is included in Appendix D. The area affected has mixed land use, with both residential and urban areas as well as industrial zoning. According to the Master Plan the City does not expect zoning changes for the project area.

2.1.3 Population Data

The historical and projected population for the City of Bronson is shown in Table 1. Population projections were based on data from the U.S. Census Bureau. The population of City of Bronson is projected to increase by about 0.04% percent annually from 2020 to 2045. As shown in the table, the City's population increased from 1980 to 2000, where it peaked, and has decreased between 2000 and 2020. The U.S. Census population for 2020 for the City is 2,345 persons.

2.2 Water Demand

A comprehensive review of the City of Bronson water system is contained in the 2023 City of Bronson Water Reliability Study. That study concluded that the system has adequate supply for both current and future demands. Replacement of undersized water main is intended to provide service to existing customers and does not impact the existing or projected water demands of the system.

2.3 Existing Facilities

A map of the existing water system is included in Figure 2.

2.3.1 Water Supply

The City of Bronson supplies its customers with water pumped from two municipal wells with a total pumping capacity of 2.16 mgd and a firm capacity of 1.08 mgd. Wells #4 and #5 are located on the eastern side of the City on Parham Road north of Chicago Street. Sodium hypochlorite and sodium polyphosphate are added at Well #4, and there are no additions to the water at Well #5.

Currently Well #4 is operating at a capacity of 760 gpm, which is higher than its permit capacity of 750 gpm. Well #5 currently pumps at 750 gpm, which is its permit capacity. The wells are equipped with a backup generator.

When maximum day demand reaches 80-percent of the firm production capacity, the Michigan Department of Environment, Great Lakes, and Energy (EGLE) typically recommends planning for supply expansion. Currently, the firm production capacity is 1.08 mgd and the projected maximum day usage for the year 2042 is 0.326 mgd, far less than 80-percent of the system's firm capacity.

2.3.2 Water Treatment

The water supplied by the City of Bronson distribution system meets all regulations established in the State of Michigan Safe Drinking Water Standards.

2.3.3 Water Distribution Mains

The existing wells are connected to customers via the distribution system consisting of some large diameter transmission (10-inch, 12-inch) pipes as well as some undersized pipes (4-inch, 6-inch). Most of the distribution system consists of 4-inch, 6-inch and 8-inch diameter pipes. The distribution system contains a fair amount of older cast iron water main installed from the 1930s – 1960s and is past its design life. A full characterization of the distribution system is included in the 2023 WSRS, attached in Appendix A.

2.3.4 Storage Facilities

Bronson owns and maintains one elevated storage tank with a 200,000-gallon storage capacity. The tank was constructed in 1960 and is located at the corner of Union Street and

Division Street. A full characterization of the distribution system is included in the 2023 WSRS, attached in Appendix A.

2.3.5 Service Lines

The City has identified the presence of lead services lines in the distribution system. Amendments to Michigan's Lead and Copper Rule were enacted by the State of Michigan in 2018 including requirements pertaining to lead service lines. To comply with the new regulations, the City completed a preliminary Distribution System Materials Inventory (DSMI) and is in the process of completing a verified inventory by January 1, 2025. It is estimated that approximately 829 water services are classified as lead service lines.

The City is actively conducting projects and planning future work to comply with the replacement requirements of 5% per year on average. The City completed 3 lead service line replacements in 2021 and 2022. The City currently has a DWAM grant and is in the process of conducting field verifications of service line materials by potholing and in-home verification in order to submit a complete DSMI to EGLE by January 1, 2025. Other service line materials known to be in the system include copper.

2.3.6 Meters

The City is in the process of replacing 100-percent of the water meters to radio-read meters. After completing the meter replacement project, the City should develop a systematic program to help maintain accurate customer billing and to capture all system revenue. The City should test/calibrate/change-out meters within a 15-to-20-year period.

2.3.7 Operations and Maintenance

Hydrant flushing is performed in the spring and the fall, and every hydrant is operated. City personnel inspects all hydrants and identifies necessary repairs during hydrant flushing. The City keeps records of hydrant activities. Hydrant flushing allows stagnant water to be discharged from the system, improving reliability of water quality.

The City currently follows a formal valve exercising program. The program enhances the reliability of the system and improves public protection. The City maintains a schedule/checklist to track the progress of the routine maintenance.

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2.3.8 Design Capacity

The water system design capacities are outlined in the 2023 WSRS in Appendix A. Supply capacity with the existing wells is adequate, with 2022 maximum day demands estimated at 30% of the firm capacity of 1.08 mgd.

2.4 Summary of Project Needs

The replacement of lead service lines and aging/undersized water main have been prioritized for increased public health protection and water system reliability. Lead service line replacements are needed to maintain compliance with the Michigan Safe Drinking Water Act (SDWA). For efficiency, projects were prioritized from previous studies that accomplished multiple goals, such as replacing aging and undersized water main while also replacing adjacent lead service lines.

The following criteria were considered during development of this PPD:

2.4.1 Standards Compliance and Reliability

The City's water system has not incurred any violations of acute or non-acute water quality standards. Aging infrastructure remains the highest priority as outlined in the 2019 AMP, 2023 WSRS, and 2022 CIP.

Compliance with the SDWA requires replacement of known or suspected lead service lines at an average rate of 5% per year. Bronson estimates there remain over 829 lead services as defined by the SDWA.

2.4.2 Orders of Enforcement Action

No orders of enforcement exist with EGLE for the City's water system.

2.4.3 Water Quality

Aging water mains lose reliability, and increase the risk of pipe failure. Loss of pressure from pipe failure can impact water quality through entry of contaminants into the failed pipe, or via backflow in customer connections. In addition, the presence of lead service lines increases the risk of lead entering the drinking water. The proposed projects would help address these water quality issues for the City of Bronson residents in the project area.

2.4.4 Projected Needs for the Next 20 Years

The City has continued to refine and utilize the 2022 CIP, using the asset management principles of probability and consequence of failure. Appendix C contains excerpts of the latest 2022 CIP and provides a detailed list of long-term projects.

3 ANALYSIS OF ALTERNATIVES

The following is an evaluation of alternatives to fulfill the project need as identified above. The analyses are grouped by project type for efficiency.

3.1 Lead Service Line Replacements

The City has prioritized the need for replacement of existing lead service lines as required in the SDWA. Below is an evaluation of alternatives to fulfill this project need.

3.1.1 No-Action – Lead Service Line Replacements

Existing lead service lines must be replaced to continue to remove potentially harmful lead materials from the water system. Furthermore, the Michigan SDWA and Administrative Rules require that all lead service lines must be replaced by 2041 at an average of 5% per year. Therefore, the no action alternative was not considered further.

3.1.2 Optimum Performance of Existing Facilities – Lead Service Line Replacements

Existing lead/galvanized water service lines are not considered eligible for optimum performance by the SDWA and must be replaced in full. Lining of service lines is not acceptable to EGLE for purposes of compliance. Therefore, this alternative was not considered further.

3.1.3 Regional Alternatives – Lead Service Line Replacements

Existing customers served by lead/galvanized water service lines cannot be otherwise served through a regional alternative. Therefore, this alternative was not considered further.

3.1.4 Routing Options – Lead Service Line Replacements

Service line installation and routing options will be considered during the design phase. Routing options are restricted by the location of the water main and the existing connection to the water customer plumbing.

3.1.5 Construction Methods – Lead Service Line Replacements

A variety of methods for service line installation have been considered including but not limited to:

3.1.5.1 Open Cut – Lead Service Line Replacements

Open cut/trenching of service lines is an available option. Trenching is often desirable for shorter service line installations where no obstructions exist, and directional drilling is not needed. Open trench installation is cost competitive in these conditions, even when considering the additional cost of restoring disturbed areas. For short service line installations without obstructions, this is the preferred method.

3.1.5.2 Directional Drill – Lead Service Line Replacements

This trenchless construction method offers benefits for service line installation, by minimizing disturbances to the ground surface and therefore restoration. It enables service line installation underneath obstructions such as roads, sidewalks, etc. It is also highly accurate by utilizing methods for steering the drilling machine. This is a preferred method for service line replacements in many cases.

3.1.5.3 Pipe Bursting – Lead Service Line Replacements

This trenchless construction method has been utilized in some service line installation projects in the past. However, it results in abandonment of existing materials below grade leaving toxic lead in the soil. This is not a preferred method.

3.1.5.4 Pipe Lining – Lead Service Line Replacements

There are existing technologies available to line service lines to reduce risk of lead exposure. However, these have been determined to be unacceptable by EGLE for compliance with the lead service line replacement requirements of the Michigan SDWA. This is not a preferred method.

3.2 Water Main Replacement Projects

Many of the project priorities in the 20-year capital improvement plan consist of replacing water distribution mains that are beyond their design life. These projects pair well with lead service line projects, and result in a more reliable water system and improved water quality. Following is an analysis of alternatives for this group of projects:

3.2.1 No-Action – Water Main Replacement Projects

The no-action alternative is unacceptable as the project need has determined the water mains are beyond their useful design life. An increased risk of breaks and leaks would lead to decreased reliability, and the potential for water system contamination.

3.2.2 Optimum Performance of Existing Facilities – Water Main Replacement Projects

For water distribution mains beyond their useful design life, optimization of existing facilities is not an acceptable alternative for mitigating the risk of breaks and leaks.

3.2.3 Regional Alternatives – Water Main Replacement Projects

The projects in this category are intended to provide direct service to water customers in the project area. Regional alternatives are not available for this intended purpose.

3.2.4 Routing Options – Water Main Replacement Projects

The projects in this category are intended to provide direct service to water customers in the project area. Routing options will be considered during project design but are limited to existing road rights-of-way for service to existing customers. The most efficient and reliable alignment will be selected for the proposed water main and will be submitted to EGLE for approval with a permit application under the SDWA.

3.2.5 Construction Methods – Water Main Replacement Projects

A variety of methods for construction have been considered including but not limited to:

3.2.5.1 Open Cut

Traditional open cut methods of excavation are used extensively in the West Michigan area for installation of most underground public utilities. Although the City is a more urban setting, the traffic volumes on many of the roads are not excessive enough to warrant the generally more expensive trenchless technologies currently used today. Open cut is the preferred method of water main replacement construction and is also necessary for targeted excavations during water main abandonment.

3.2.5.2 Directional Drill

Directional drilling is the process of using a small, steer-able steel pipe that is guided under the soil to create a pilot hole. The pipe is guided by above-grade monitoring equipment that tracks the depth and location. Once the guided head reaches its location, the host pipe is attached and pulled back through the pilot hole.

Horizontal Directional Drilling (HDD) is more cost effective when trying to avoid surface disruptions and there are few services requiring digging up and tapping. In the case of the proposed projects in this PPD, water services are located very close together requiring numerous access pits to be dug. Another problem in the tight urban environment is the location of numerous other utilities within the right-of-way. To avoid them with directional drilling, the main would be installed deeper than the standard 5 to 6 feet resulting in a less accessible and maintainable water main for the City. This option will not be pursued for water main replacement; however, it will be considered and used extensively during water service replacements.

3.2.5.3 Pipe Bursting

Pipe bursting is another trenchless method of pipe replacement where a new pipe of the same or larger diameter is pulled through the existing host pipe while "bursting" the deteriorating pipe. Access is needed on both ends of the pipe. A hydraulic machine would then pull the new pipe back toward the receiving pit behind the bursting head, which breaks up the brittle host pipe to make space for the new one. Pipe bursting is often used to replace water services from the property line to inside the house with minimal disturbance to the private property. It is less commonly used for replacement of larger diameter pipes such as water mains.

Pipe bursting of water main is cost effective when the water main will not be in the roadway. With pipe bursting, every service tap, valve, tee or other fitting requires digging up to install. Due to the number of excavations required to replace water services in the

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dense urban setting, pipe bursting will not offer a significant advantage. Pipe bursting will not be considered in this application.

3.2.6 Pipe Material – All Water Main Projects

Polyvinyl chloride (PVC), Polyethylene (PE), and ductile iron are the three most common water main materials for the pipe in the 6-inch to 16-inch diameter range.

3.2.6.1 Polyvinyl Chloride (PVC) Pipe / Polyethylene (PE) Pipe Water Main

PVC and Polyethylene pipe is manufactured from petroleum derivatives, chlorine gas, and vinyl chloride. PVC/Polyethylene is known to have a probable negative impact on the environment by their production. Not only is PVC/Polyethylene an environmental concern, but these pipe materials are also sensitive to other natural environmental impacts like ultraviolet light exposure, temperature, etc. According to UNIBELL, the nationally recognized authority on PVC/Polyethylene, the impact resistance of PVC/Polyethylene pipe is reduced by approximately 20 percent when exposed to ultraviolet light for extended periods of time.

The installation of PVC/Polyethylene is sensitive to the type of materials used for bedding the pipe in the trench. The strength of PVC/Polyethylene comes from supporting the pipes from the centerline of the pipe and below. This requires close attention to proper compaction of the necessary granular pipe backfill. PVC/Polyethylene pipe has been known to deflect under static loads of the soil column to the point of bursting. Since PVC/Polyethylene is sensitive to installation compared to ductile iron, the cost associated with the installation of the material is generally more than ductile iron. However, polyethylene piping is generally regarded as cost effective.

Another drawback to PVC/Polyethylene is its ability to allow hydrocarbons from contaminated soils or chemical spills to permeate the PVC/Polyethylene and possibly contaminate the drinking water.

PVC/Polyethylene materials are more difficult to locate because current locating technologies rely on the magnetic properties of the pipe material. Locating PVC/Polyethylene pipe materials may require the installation of a magnetic tracing wire that can be avoided in other construction activities. The tracer wire can also corrode over time making locating the pipe more difficult. This can have a negative impact on local residents, since locating the water main would require a greater amount of excavation.

Due to the above concerns, PVC and Polyethylene pipe materials will not be further considered for the proposed projects for use as a water main.

3.2.6.2 Ductile Iron Water Main

Ductile iron pipe has been used in the construction of new water main since the late 1970's. According to the Ductile Iron Pipe Research Association, ductile iron pipe is thirteen times more impact resistant than similar pipe constructed of PVC/Polyethylene.

Ductile iron pipe is ferrous and more easily located by current locating technologies. Ductile iron pipe allows more protection from hydrocarbon contamination and chemical spills. The cost of installing ductile iron pipe may be slightly less than PVC since ductile iron pipe is less dependent on the surrounding soils for its strength. The materials for manufacturing ductile iron pipe are more environmentally friendly than PVC pipe and Polyethylene pipe since it is made from recycled steel.

There are numerous advantages of using ductile iron pipe over PVC/Polyethylene for water main; therefore, ductile iron pipe will be utilized in the construction of the proposed selected water main projects.

3.3 Additional Projects over the 20-year period

3.3.1 New Main Loop Projects

As identified in the 2022 CIP and 2023 Water Reliability study, there is a need to construct new water main to connect multiple dead-end mains throughout the City. Over the next 20 years, the City is considering the construction of approximately 12,650 feet of new water main to improve water quality and increase fire protection by closing dead ends throughout the system. This work would include transmission mains ranging from 8-inch to 12-inch.

4 IDENTIFICATION OF PRINCIPAL ALTERNATIVES

4.1 Monetary Evaluation

Detailed cost estimates for the principal alternatives are included in Appendix E. A present worth analysis comparing alternatives was not completed because project alternatives do not meet the project need. For water main replacement projects, the do-nothing alternative and optimizing performance of existing do not resolve the project need of addressing aging infrastructure that is unreliable. This also applies to lead service line replacement projects.

4.2 The Environmental Evaluation

Pursuant to EGLE guidelines, several cultural and environmental organizations were contacted during preparation of the PPD. A cursory review was completed for impacts to environmental and cultural resources, and correspondence with these entities is included as noted below. The following is a discussion on the potential cultural or natural environment impact because of the proposed construction activities. Additional analysis of the potential for environmental impacts is included in Section 6.

4.2.1 Cultural Resources

The areas that are served by the City's water system are located in western Branch County. The proposed projects are within previously developed areas. No historic or archaeological impacts are anticipated due to the construction of the proposed projects. According to the National Register of Historic Places, there are no structures that are designated for historic preservation within the City.

4.2.2 Environment

Air Quality

National Ambient Air Quality Standards are health-based standards set by the United States Environmental Protection Agency (US EPA). The entire state of Michigan is in attainment for carbon dioxide, nitrogen dioxide, particulate matter, and lead. According to the "Air Now" forecast courtesy of EGLE, the primary pollutant in the City of Bronson is particulate pollution, but it is in attainment.

It is not anticipated that the proposed projects would facilitate the growth of residential or commercial development, since the projects are focused on rehabilitating existing water infrastructure. Therefore, these projects would not negatively impact the air quality in the affected areas.

Wetlands

No wetlands exist within the study area.

Coastal Zones

None of the proposed projects would take place in Great Lakes shorelands, coastal zones, or Coastal Management Areas.

Floodplains

None of the proposed projects would take place within FEMA Flood Zones.

Inland Lakes and Streams

None of the proposed projects would take place near inland lakes and streams. No bodies of water would be modified during the proposed projects.

Natural or Wild and Scenic Rivers

No designated wild, scenic, or natural rivers exist within the study area. The proposed projects would be located within the St. Joseph watershed.

Agricultural Resources

No prime farmland exists within the project area.

Fauna and Flora

Impacts to federally threatened and endangered species near and within the project area from the US Fish and Wildlife Service (USFWS) Information were studied through the Planning and Conservation System (IPaC). The Official Species List Letter from USFWS is provided in Appendix H and summarized below. The Verification Letter from USFWS is also provided in Appendix H and summarized below.

Species	Category	Notes
Indiana Bat	Endangered	May affect, not likely to adversely effect
Northern Long-eared Bat	Endangered	May affect, not likely to adversely effect
Tricolored Bat	Prop. Endangered	No Effect
Copperbelly Water Snake	Threatened	No Effect
Eastern Massasauga	Threatened	May affect, not likely to adversely effect
Mitchell's Satyr Butterfly	Endangered	No Effect
Monarch Butterfly	Candidate	No Effect

The USFWS Verification Letter clarifies the approval is contingent upon removal of trees in the project area inside the inactive season for Indiana bat, between October 1 and April 14. This will prevent adverse effects to the protected bat species. This restriction will be incorporated into the contract documents for construction during detailed design.

In addition, the Michigan Natural Features Inventory provided County-level data on State designated species for Branch County. This list is included in Appendix H. The proposed projects are not likely to have an adverse impact to the species listed based on a review of the project area.

Soils

No undisturbed soil would be affected by the proposed projects. The natural soils in the study area are dominated by loamy soils underlain by sand and gravel in the Spinks-Oshtemo-Boyer Association and Oshtemo-Brady-Gilford Association, as depicted by the Soil Association Map produced by Michigan State University and the U.S. Department of Agriculture Soil Conservation Service in 1981. An NRCS Soil Survey is included in Appendix J.

4.3 Mitigation

Environmental adverse impacts for water main replacement and lead service line replacement are not anticipated and mitigation is not proposed at this time. Short-term mitigation measures such as soil erosion control or de-chlorination of water used for disinfection are considered incidental to the work and will minimize impacts during construction.

4.4 Implementability and Public Participation

The City of Bronson is the sole owner and operator of the public water system and maintains the legal authority and managerial capability to conduct the proposed projects. The principal alternatives identified herein will be presented to the public for input and discussion. Items of particular importance for the public to consider are financial burdens on the municipality, any competing uses of proposed sites, and impacts to the operations and maintenance of the water system.

4.5 Technical Considerations

The design and construction of water distribution mains will be conducted in accordance with applicable standards in the SDWA, as well as the Recommended Standards for Water Works by the Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers ("Ten States").

Replacement of lead service lines will also follow best practices including available guidance from EGLE regarding customer notification and education on flushing after replacement.

4.6 Areas of Contamination

There are several known contamination sites within the service area of the City.

In order to maintain the quality of the below-grade environment and groundwater in the proposed project area, a review of Michigan's Environmental Mapper program by the Michigan Department of Environment, Great Lakes, and Energy's (EGLE) was reviewed. The sites in the area were plotted as shown in Appendix I. The environmental sites mapped include Baseline Environmental Assessments (BEAs), Brownfield sites, Michigan Part 201 sites, active and closed underground storage tanks (UST), and leaking underground storage tank (LUST) sites. Restrictive covenants over property are also shown and these restrictive covenants were recorded generally due to environmental contamination. As shown in Appendix I, some sites of contamination are located within the proposed project areas where excavation is anticipated to complete the project, as further discussed below.

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A Part 201 site is near the intersection of Railroad Street and Douglas adjacent to proposed water main replacement projects. This site is located at the 505 N. Douglas and is owned by Borg Warner and Anastasia Hamel. This Part 201 site also has a Restrictive Covenant. There is limited information available for this Part 201 site, and no pollutants are listed, which can be determined by reviewing EGLE's Part 201 file for this site. The proposed water main replacement project will include further investigation during detailed design to determine any potential environmental impact.

A second Part 201 site is located at the northeast and southeast corner of E Railroad St and N Matteson St. This site is located at the 606 N. Matteson Street and is owned by the City of Bronson. There is a Restrictive Covenant on the property and its adjacent to a proposed water main replacement project. This site will also require additional review during detailed design to obtain information to determine the potential environmental impact on the proposed project.

A third part 201 site is just north of W Railroad St, between N Walker St and N Matteson St, adjacent to a proposed water main replacement project. This site is located at 141 W Railroad St and is owned by Scott & Fetzer Corporation. There is limited information available for this Part 201 site; however, it lists the contaminates as chlorinated volatile and semi volatile organic compounds. The proposed water main replacement project will include further investigation during detailed design to determine any potential environmental impact.

A fourth Part 201 site is located at the intersection of Mowry Ave and Rudd St, adjacent to a proposed water main replacement project. This site is located at 559 Rudd St. There is little to no information available for this site, and no contaminants are listed. The proposed water main replacement project will include further investigation during detailed design to determine any potential environmental impact.

There are also two closed Part 211 Underground Storage sites and one close part 213 Lust site adjacent to proposed replacement projects.

5 SELECTED ALTERNATIVE

Based on a review of the existing facilities, identification of project needs, and analysis of alternatives, this section will present a detailed and comprehensive description of the selected

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alternatives. Figure 1 presents locations of the selected alternatives, which are described in general below.

5.1 Project No.'s 1-15: 4- and 6-inch Water Main Replacement – FY2024

See Table 3 for a complete summary of the selected alternatives, and Appendix E for detailed cost estimates. These projects were selected due to the existing water main size and age. These projects collectively include approximately 19,530 feet of 8-inch and 400 feet of 10-inch water main replacement. They are replacing mostly 4-inch and 6-inch main installed in 1930. The water main is undersized for peak demands and beyond its design life. These projects will provide increased capacity for flow and pressure and increased reliability of service to water customers. Project 6 includes 200 feet of new 8-inch water main as a looping project to connect the existing dead end in State Street to the existing main in Douglas Street. Project 14 includes 500 feet of new 12-inch main as a looping project to connect the existing main in Wayne St.

The estimated cost for these projects is \$9,575,285 in 2022 dollars and \$11,639,600 in 2026 dollars based on a 5% inflation rate.

5.2 Project No. 16: Lead Service Line Replacement – FY2024

This PPD includes the replacement of 829 lead service lines spread throughout the City of Bronson. These service lines have been identified as likely containing lead through the City's CDSMI program. The replacement will include potholing of services to verify the material type, replacement of the service line from the water main to the house connection, restoration of the yard and sidewalk as necessary, and other miscellaneous items necessary to complete construction. These replacements will allow the City of Bronson to meet the requirements of the Lead and Copper Rule.

The estimated cost for the service line replacements is \$10,918,348 in 2022 dollars and \$13,271,400 in 2026 dollars based on a 5% inflation rate.

5.3 Project Schedule

The table below is a schedule for proposed Projects; the proposed water system improvements that are intended to be included as part of the City's FY 2024 DWSRF Project. They would be funded under the fourth quarter of fiscal year 2024.

Milestone	Date
Hold Public Hearing	April 10, 2023
Submit Final PPD to EGLE	June 1, 2023
Receive Approval of PPD	September 2023
User Charge System Approved	October 2023
Plans and Specifications Approved	May 2024
Receive Construction Bids	August 2024
DWSRF Loan Closing	September 2024
Begin Construction	April 2025
Construction Completed	November 2026

DWSRF Project (4th Quarter 2024) Proposed Project Schedule

5.4 Cost Estimates

Appendix E contains cost estimates for the selected alternatives for water system improvements. The project cost estimates include construction costs plus 35% for construction contingencies, legal, administrative, and project engineering costs.

5.5 User Costs

The City anticipates funding the FY2024 projects with an estimated \$24,911,000 DWSRF loan. Assuming a 1.875% interest rate for a 40-year period, the expected annual debt service for the loan, will be approximately \$890,796 per year. The City has 1096.5 residential equivalent units per their AWWA meter standards customer calculations. This translates to an annual cost of \$812.40 per REU, or \$67.70 per REU per month in the City.

The City has been working on financial plans to address needed capital improvement projects over the last several years. A more detailed rate analysis will be conducted if these projects are funded through the DWSRF. Payments on DWSRF loans are expected to be covered through rate adjustments. Consideration will also be given to ensuring rates are as affordable as possible for the community.

5.6 Overburdened Community

The City of Bronson qualifies as an overburdened community under the DWSRF program. The median annual household income (MAHI) was \$41,476 and a Taxable Value Per Capita of \$14,623 according to the most recent Census Bureau and tax data. A completed *Overburdened Community Status Determination Worksheet* is included in Appendix M.

5.7 Authority to Implement the Selected Alternatives

Implementation of the proposed project is based on the assumption that the project will be financed by a low-interest loan from the DWSRF program. The City of Bronson has the necessary legal, institutional, financial, and managerial resources available to ensure the construction, operation and maintenance of the proposed facilities. Water system construction will occur in either existing road right-of-way or obtained utility easements on private property. For water service replacements, the City is under obligation to fund replacements on private property by the Michigan SDWA. In these instances, property access agreements are required to be secured for each property owner/resident.

5.7.1 Financials

The City has been working on financial plans over the last several years to help address its capital improvement projects. A more detailed rate analysis will be conducted if these projects are funded through the DWSRF. Payments on DWSRF loans are expected to be covered through planned rate adjustments. Further details on rate increases are described in Section 5.5.

5.7.2 Design/Permits

FY2024 projects will be under design later in 2023 and into 2024 and will be submitted for necessary permits prior to the required deadline.

6 EVALUATION OF ENVIRONMENTAL IMPACTS

6.1 General

An evaluation for important resources in the project area was conducted, including Historical/Archaeological/Tribal resources, as well as natural resources such as wetlands, floodplains, streams, and habitat for threatened and/or endangered species. The anticipated environmental impacts resulting from the construction of the selected projects may include beneficial and adverse impacts, short and long-term impacts, and irreversible and irretrievable

impacts. There may also be social or economic impacts from proposed projects that should be identified. The following is a discussion of the anticipated impacts of the selected projects on environmental resources identified.

6.1.1 Beneficial Impacts

- Construction and equipment manufacturing related jobs would be generated.
- Local contractors would have an equal opportunity to bid on the construction contracts.
- Reduced risk of lead exposure to residents with lead water services.
- Improvement of drinking water quality and reliability.
- Lower consumption of energy and natural resources due to decreased potential of water loss due to replaced water services.
- More reliable drinking water distribution system.

6.1.2 Adverse Impacts

- Some vegetation removal is likely.
- Noise and dust would be generated during construction of the project.
- Potential for increased exposure to lead in water during construction activities.
- Disruption of routine for residents when replacing water service on private property and inside houses.
- Increased traffic during construction.
- Use of energy and natural resources during construction.
- Potential for impacts to downtown historical district

6.1.3 Short and Long-Term Impacts

The short-term adverse impacts associated with construction activities would be minimal, and mitigable, in comparison to the resulting long-term beneficial impacts.

6.1.3.1 Short Term Adverse Impacts

- Traffic disruption.
- Dust and noise.
- Use of energy and natural resources.
- Increased risk of lead exposure during water service replacements.

• Construction safety hazards – the projects will be designed with the overall health and safety of construction workers and operators in mind, although construction site safety is the Contractor's responsibility.

6.1.3.2 Short Term Beneficial Impacts

- Construction and equipment manufacturing related jobs would be generated.
- Local contractors would have an equal opportunity to bid on the construction contracts.

6.1.3.3 Long Term Adverse Impacts

• None identified.

6.1.3.4 Long Term Beneficial Impacts

- A more reliable water distribution system.
- A water system with adequate flow and pressure for peak demands.
- Reduced risk of lead exposure for residents with lead water services.
- Lower operation and maintenance costs due to reduced risk of water main and water service breaks.
- Reduced water loss.

6.2 Analysis of Impacts

6.2.1 Direct Impacts

Impact to these resources will be avoided were possible. If impact is unavoidable, it will be minimized and mitigated, and necessary permits will be obtained.

6.2.1.1 Land-Water Interfaces

The EGLE Wetlands Map Viewer was utilized to look for potential wetlands that may be impacted by the proposed projects. A copy is provided in Appendix G, which indicates presence of wetland soils and some wetlands from NWI/MIRIS maps within the City limits. However, all proposed work will be limited to existing road right of ways and in upland soils in urban areas. Based on this information, impacts to wetlands are not anticipated with the proposed projects.



The National Flood Hazard Layer FIRMette was obtained for the City of Bronson (effective 2/17/2010), and is included in Appendix G. The entire City is mapped as a "Zone X", an area with minimal flood hazard, and no base flood elevation is given. The proposed work is located in upland areas within existing street right-of way and will not impact floodplain areas. In addition, a permanent change of grade is not being proposed. Based on this information, impacts to the floodplain are not anticipated with the proposed projects.

6.2.1.2 Construction Impacts

The construction of the proposed project is not anticipated to affect historic, archaeological, geographic, cultural or recreational areas, as most construction activities would be within road rights-of-way or previously disturbed soil. Previously referenced figures show the proposed construction locations for each project. Where service line replacement enters existing buildings, the existing foundation penetration will be utilized to ensure minimal impacts to the existing structures.

The projects will not detrimentally affect the water quality or air quality in the area, since water quality can be protected during construction using erosion control best management practices.

The proposed projects are not intended to extend or construct new road to previously undeveloped lands within the work areas. The proposed work is to replace or improve an existing water distribution system to better serve its existing customers.

Groundwater depths in the project area are expected to be a few feet below typical water main installation depth. If needed, dewatering will be performed to ensure excavations are controlled, safe, and sanitary. If extensive, additional investigation may be warranted for potential impacts to natural resources or adjacent private wells. Additional information on groundwater depths will be collected during detailed design.

6.2.1.3 Operational Impacts

The construction will be planned so that service disruptions to customers will be minimized. Communications with customers will be crucial to completing the lead

service line replacement work on private property, which helps ensure customers are aware of the impacts of the work to their service.

6.2.1.4 Social Impacts

If DWSRF funding is provided for the proposed projects, user rates will require a burdensome change as they are already considered overburden. See Cost Analysis in Appendix E for further details on user costs.

As practicable, construction will be staged and scheduled so that residents have access to their home and business.

The DWSRF program requires competitive bidding for projects exceeding \$50,000. This will allow a larger number of contractors to bid on the projects compared to projects that would be solicited to a short list of contractors. Construction related jobs may be created due to the amount of work anticipated to be completed in the next few years.

The water main will typically be installed outside the road surface, and may impact sidewalks and intersections of roadways to cross the road during construction. In most cases, portions of existing sidewalks and road crossings effected by water main construction will be replaced to their existing extents. The reconstruction of sidewalks and intersections will meet current ADA standards of compliance and improve safety.

6.2.2 Indirect Impacts

The proposed water facilities are sized to provide service for 20 years of future growth in the study area, based on current trends. Future growth in the study area will not greatly alter the character of the area. Future growth would be subject to conformance with the land use and zoning plans of the City.

6.2.3 Cumulative Impacts

Providing a more reliable water distribution and well system with new updated equipment, pipes, and structures to the customers of the system is the primary cumulative impact anticipated from the construction of the project. Minimal short- and long-term environmental impacts are not anticipated to be cumulatively significant.

7 MITIGATION

7.1 Short Term Construction Related Mitigation

Standard procedures used in the construction industry will be included in the construction contract documents to mitigate construction activities.

7.1.1 Traffic Disruption

Water main replacement projects are located in the road rights-of-way where streets, parking areas and pedestrian facilities may be impacted. The components of each project will be coordinated carefully with residences and businesses in the area, and construction methods will be selected to minimize disruptions. Standard traffic and safety control devices such as barricades and lighted barrels will be in place to warn and protect residents during construction activities.

7.1.2 Dust and Noise

Dust control methods such as water and/or brine will be used to keep dust to a minimum. Haul roads and public roadways will be swept daily and maintained to assure residents access to the area. Construction equipment will be maintained in good condition to decrease noise.

7.1.3 Soil Erosion

Soil erosion and sedimentation control measures such as silt sacs and silt fence, will be part of the construction activities to prevent soil release and protect streams and wetlands.

7.1.4 Water Service Disruption

During construction of the water distribution system improvement projects, residents and businesses existing water services must be transferred to the water mains. In order to limit the negative impacts, communication with the public will be important. Notification will be provided 24 hours prior to any service interruptions to provide time to prepare for a shortterm interruption. Coordination will be required to schedule times with the property owners to enter buildings and replace the water services.

The requirements outlined by EGLE for notification to residents will be strictly followed. Residents will be contacted by letter informing them of the upcoming project. Information



will be provided to them about what to expect, what the service replacement will consist of, how to schedule an appointment and the risks of lead exposure during and after construction. Directions on how to flush the plumbing and clean aerators will be provided to the residents.

7.1.5 Potential Loss of Wildlife / Habitat

The water main replacement and lead service line replacement construction activities will occur in previously developed areas and existing roadway. Therefore, it is unlikely that these projects would impact habitats of the endangered and threatened species within the study area.

The one exception to the above statement is removal of mature trees greater than 5-inches diameter, which may represent potential habitat for threatened and/or endangered bat species identified by the USFWS. Reference Section 4.2.2 for more information on species identified, and the below section for plans to mitigate this potential loss of habitat.

7.2 Mitigation of Potential Long-Term Impacts

General construction activities in the water system improvements will prohibit the disposal of soils in wetlands, floodplains, or other sensitive areas. Catch basins will be protected on the distribution system where earth changing activities will take place to reduce sedimentation.

7.2.1 Habitat Loss

Mitigation of potential direct impacts of the project due to tree removal is planned to be through a seasonal restriction on tree removal. By restricting mature tree removal to the period between October 1 through April 14, impacts are mitigated as this is the hibernation season for the protected species.

7.2.2 Permits

Act 399 water supply system construction permits will be obtained. While it is not anticipated, permit applications can be submitted and permits obtained from the EGLE for wetlands (Part 303), floodplains (Part 31), and inland lakes and streams (Part 301) should they be determined necessary during detailed design of the projects.

7.2.3 Use of Natural Resources

As a result of the water main and water service construction, natural resources such as gravel, sands, oil, and fuels will be utilized and/or consumed. The long-term benefits for most of the proposed projects will result in reduced use of natural resources.

Recycled materials like scrap iron will be used to make the ductile iron water main pipe. This will require less use of iron ore that is mined from the ground. The use of erosion control measures will be composed of recycled or natural products that do not use (or use less) synthetic materials.

7.2.4 Energy Use

The use of energy is inevitable in operating well pumps, maintaining water distribution infrastructure, and producing materials used for construction. Using recycled or natural eco-friendly products as part of the construction process will use less energy compared to using nonrenewable resources. The use of the recycled and/or eco-friendly products will not completely mitigate the use of all energy, but it will offset a small percentage.

Energy use from pumping water through the system may be reduced slightly, through installation of new and appropriately sized water mains and service lines as well as abandonment of old (parallel) water mains.

7.3 Mitigation of Indirect Impacts

There are no major projected changes in the land use of the study area that would significantly impact water demands beyond the average daily demand projections and maximum daily demand projections. A copy of the zoning map for the City is included in Appendix D. All projects are proposed in order to replace or improve existing water main and water service piping and well infrastructure. None of the proposed projects are located in areas where significant growth or land use changes are projected to occur.

The community's ordinances can be found on their website. General rules reflect EGLE permit requirements, such as storm water containment, and soil erosion and sedimentation control.

8 PUBLIC PARTICIPATION

8.1 Public Meeting

A notice of the public meeting was published in the Coldwater Daily Reporter, on March 24, 2023, fifteen days prior to the public meeting. A copy of the notice and an affidavit of publication are provided in Appendix K. A copy of the Project Planning Document was available to the public at City Hall during the public comment period. An electronic version of the PPD was also posted on the City's website. A copy of the website posting is provided in Appendix K.

The public meeting describing the draft PPD was held at 5:00 PM on Monday, April 10, 2023, at City Hall as part of a regular Council Meeting. A presentation was given by Prein&Newhof during which a description of the DWSRF program and general comments on the PPD were presented. The presentation slides are included in Appendix K. It was noted that the PPD discusses alternatives evaluated, cost estimates for projects and potential environmental impacts. A copy of the meeting minutes is included in Appendix K.

8.2 Adoption of Project Planning Document

After closing the hearing, the City Council passed a resolution adopting the Project Planning Document. A copy of the signed resolution is provided in Appendix L.

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- Table 1
 Historical and Projected Population
- Table 2
 Average and Maximum Day Demand Projections
- Table 3
 Summary of Selected Alternatives

City of Bronson DWRF Project Plan

Year	City of Bronson	Branch County
Historic Population ¹		
1970	2,390	37,906
1980	2,271	40,188
1990	2,342	41,502
2000	2,421	45,787
2010	2,349	45,248
2020	2,345	44,159
Projected Population ²		
2022	2,349	43,664
2025	2,335	44,654
2027 (5-Year)	2,355	44,852
2030	2,365	45,149
2035	2,375	45,644
2040	2,385	46,139
2042 (20-Year)	2,389	46,337
2045	2,395	46,634

Table 1 - Historical and Projected Population

Notes:

¹ Historic population data from 1940 to 2020 is from the U.S. Census Bureau.

² Population projections through 2050 are from the Southcentral Michigan Regional Planning Council.

City of Bronson

DWRF Project Plan

Table 2 - Existing and Projected Water Demands

Year	Average Day Demand, mgal	Maximum Day Demand, mgal	Peak Hour Demand, mgal	Max Day Multiplier (Max Day / Average Day)	Peak Hour Multiplier (Peak Hour / Avg Day)
2022	0.173	0.323	0.864	1.87	5.0
2027	0.173	0.324	0.866	1.87	5.0
2032	0.174	0.324	0.868	1.87	5.0
2037	0.174	0.325	0.870	1.87	5.0
2042	0.174	0.326	0.871	1.87	5.0

Note: Based on 0.04% estimated population growth for the total system.

Table 3 Summary of DWSRF Projects

Project ID Code & Description	Existing Diameter (in)	Proposed Diamter (in)	Length of Project (Ft)	Year Installed	Cost	Future Costs - 2026
PROJECT #01: Mowry Avenue / Shaffmaster (Rudd to Union) - Replacement	4	8	2,700	1957	\$1,287,698	\$1,565,300
PROJECT #02: South Street (Division to Ruggles) - Replacement	4	8	900	1957	\$389,003	\$472,900
PROJECT #03: Douglas (Grant to Union) - Replacement	4	8	2,250	1930	\$1,172,475	\$1,425,200
PROJECT #04: Franklin Street (Ruggles to Douglas) - Replacement	4	8	350	1930	\$182,993	\$222,500
PROJECT #05: Walker (York to Railroad) - Replacement	4	8	1,400	1930	\$681,345	\$828,200
PROJECT #06: State Street (Douglas to Matteson) - Replacement / Loop	4	8	1,000	1930	\$476,434	\$579,200
PROJECT #07: N Douglas & W Railroad (Union to Matteson) - Replacement	4 & 6	8	1,000	1930	\$523,638	\$636,500
PROJECT #08: E Railroad Street (Buchanan to Winona) - Replacement	10	10	400	1930	\$151,403	\$184,100
PROJECT #09: Buchanan Street (Chicago to Railroad Street) - Replacement	4	8	1,800	1930	\$819,923	\$996,700
PROJECT #10: Winona Street (Chicago to Railroad Street) - Replacement	4	8	1,700	1930	\$834,773	\$1,014,700
PROJECT #11: Washington Street (Chicago to Railroad Street) - Replacement	4	8	1,670	1930	\$756,864	\$920,000
PROJECT #12: Lincoln Street (Chicago to Filmore Street) - Replacement	4	8	1,220	1930	\$549,842	\$668,400
PROJECT #13: Filmore Street (Washington to Sherman St) - Replacement	4	8	600	1930	\$295,515	\$359,300
PROJECT #14: Corey Street (Matteson Street to Wayne Street) - Replacement / Loop	4	8	2,200	1930	\$1,191,848	\$1,448,700
PROJECT #15: Chicago and Corey and between Matteson to Cynthia - Replacement	4	8	740	1930	\$261,536	\$317,900
PROJECT #16: Lead Service Replacement - City wide					\$10,918,348	\$13,271,400
TOTAL					\$ 20,493,633	\$ 24,911,000

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- Figure 1 Selected Water System Improvements Map
- Figure 2 Existing Water System Map






Appendix A

2023 Water System Reliability Study

Water System Reliability Study

WSSN #MI0000910

Prepared for City of Bronson Branch County, Michigan

January 2023

2200804





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EXECUTIVE SUMMARY

This report represents the update to the 2016 Water Reliability Study for the City of Bronson. Significant improvements have been made to the system since that time. After reviewing the primary components of the water distribution system – water supply, distribution, and storage – the following conclusion could be made:

- The City provides adequate water supply to customers for normal (non-emergency) system conditions.
- Existing maximum day demands have reached 30% of the firm supply capacity of the system. Under current demand projections, the maximum day demand will not reach 80% of the firm supply capacity in the next 20 years. The current well capacity is sufficient to supply water to customers.
- The system transmission is adequate, although additional redundancy of the primary transmission main and several other projects to close transmission main loops are proposed for improved reliability.
- The City desires to provide fire protection to residential customers of 1,000 gpm for 2 hours, to commercial customers of 2,500 gpm for 2 hours, and to industrial customers of 3,500 gpm for 3 hours. Specific distribution and transmission system improvements have been recommended for improved fire protection in some areas of the system to meet these goals. Some areas of the system are aging, and continued distribution main replacement is recommended to maintain suggested fire flows and a high level of service.
- Existing storage is sufficient to supply equalization and 2,000 gpm of fire demand for 2 hours for existing, five-year, and twenty-year projected demands. In order for the fire flow goals stated in the previous bullet to be achieved, more storage and/or increased supply capacity would need to be provided.
- The City provides high quality water and has met the regulations for all known contaminants.
- The City has completed a service line inventory in accordance with the lead and copper rule requirements. Random verification of 20% of service lines with unknown material was completed in 2022 via potholing around the curb box, and 100% of inside service line inspections are being completed by City staff in conjunction with a meter replacement program.

• Estimated water loss in the system has averaged 16% over the past five years. The City should track known, unbilled water use. With the additional volume considered from known, unbilled sources, this estimated water loss is considered reasonable. The City should continue with the water accountability program to ensure that non-revenue water is minimized.



v

1 INTRODUCTION

The City of Bronson is in Branch County in southern Michigan, approximately 10 miles southwest of Coldwater. The City operates and maintains a water supply for the City of Bronson. The existing system is shown in Figure 1.

The purpose of this report is to provide a reliability study for the Bronson water system, which in turn is intended to fulfill specific requirements of Part 12 and Part 16 promulgated under Michigan's Safe Drinking Water Act, 1976, P.A. 399, as amended. The Act calls for a 20-year projection of water demands and an evaluation of each of the system components over a five-year interval.

Population projections and historical population data from the United States Department of Commerce, Bureau of Census (through the 2020 census), are included in this report. The water distribution system analysis identifies current and projected water demands and includes a computer assisted network analysis of the water distribution system.

Based on the analysis, recommendations for improvements to the water supply system are made and cost estimates are presented for the improvements.

Since completion of the last reliability study update in 2016, the City has made several improvements to their water transmission and distribution network. The following is a list of improvements the City has made since 2016:

• 2021 - Replaced approximately 500 feet of 6-inch main on Compton Street from Mowry Avenue to South Ruggles Street with 8-inch main.

2 WATER DEMANDS

Land use within the City is mixed with a significant number of residential neighborhoods and some commercial and industrial areas. The main commercial areas are located on Chicago Street and Matteson Street and the industrial areas are located along Union Street, Industrial Avenue, and Mill Street. As of 2022, the City has 938 service connections and a customer population of approximately 2,305 people. Breakdowns of water use by customer type are provided in the table below.

	Customer	Known	Total Billed	
Year	Total Res. & Comm. (gallons)	Total Industrial (gallons)	Unmetered (gallons)	Usage (gallons)
2016	44,990,516	1,848,800	5,548,000	52,387,316
2017	43,839,715	1,500,800	5,548,000	50,888,515
2018	42,639,352	2,633,200	5,548,000	50,820,552
2019	40,653,978	3,101,600	5,548,000	49,303,578
2020	40,761,568	2,182,300	5,548,000	48,491,868
2021	41,377,983	1,863,600	5,548,000	48,789,583

Water Use by Customer Type

Note: No known unmetered data was provided. Mobile Manor (28 accounts), Housing Authority (47 accounts), and Library (1 account) are unmetered, it was assumed that each account used 200 gallons per day, resulting in an annual use of 5.548 mgal.

2.1 Population Projections

Population projections for Bronson are shown in Table 1 and are graphically illustrated in Figure 2. Historical population data from 1970 to 2020 was taken from the U.S. Census Bureau. The projected annual rate of population increase for the City of Bronson is 0.04%, based on the population change over the past 40 years. The 0.04% annual growth rate was used for this study to project both population and system demands.

Historical water demand data for the service area is provided in Appendix A and summarized in Table 2. From this data and population projections, the following was projected into the future: average day demand, which is the average daily water use for the year; maximum day demand, which is the highest daily use for the year; and peak hour demand, which is the estimated maximum hour of water use during the year.

2.2 Average Day Demands

Historic water demand data for the service area was provided by Bronson in the form of Monthly Pumpage Summary Reports for 2014-2021, as shown in Table 2. From this data, the average day demand was estimated.

Based on the historical high maximum day demand and an estimated maximum day demand multiplier of 1.87, the 2022 average day demand is estimated to be approximately 0.173 million gallons per day (mgd). By using the population growth projection of 0.04% annual growth for maximum day demands over the next twenty years, the 2042 average day demand is projected to be 0.174 mgd. Existing and projected average day water demands for the Bronson water system are provided in Table 3.

2.3 Maximum Day Demands

The historic maximum day demands for the Bronson water distribution system are shown in Table 2, while projected maximum day demands are presented in Table 3. The maximum day factor is a ratio comparing the average day demands to the maximum day demands. A maximum day demand factor of 1.87 was assumed to determine projected maximum day demands for the next twenty years. This demand factor represents the average maximum day demand factor experienced by the system over the past five years. The 2022 maximum day demand was determined to be approximately 0.323 mgd. The projected maximum day demand for 2042 is 0.326 mgd. Figure 3 graphically depicts the projected demands.

2.4 Peak Hour Demands

Peak hourly water demands are typically not recorded but can be estimated from instantaneous high service pump flows and storage tank elevations. Often residential water use has a relatively high peaking factor while industrial customers reduce the overall peaking factor since water use is often steadier during a typical day. A peak hour factor of 5 times the average day demand was used to estimate peak hour demands, based on estimates for similar communities. This peaking factor results in a 2022 peak hour demand of 0.864 mgd and a projected 2042 peak hour demand of 0.871 mgd. The peak hour projection has been included in Figure 3.

3 WATER SYSTEM INFRASTRUCTURE

3.1 Water Supply Source

The City of Bronson supplies its customers with water pumped from two municipal wells with a total pumping capacity of 2.16 mgd and a firm capacity of 1.08 mgd. Wells #4 and #5 are located on the eastern side of the city on Parham Road north of Chicago Street. Sodium hypochlorite and sodium polyphosphate are added at Well #4, and there are no additions to the water occurring at Well #5. Table 4 includes several details for each of the wells.

Table 5 details the capacities for the individual wells. Currently Well #4 has is operating at a capacity of 760 gpm, which is higher than its permit capacity of 750 gpm. Well #5 currently pumps at 750 gpm, which is its permit capacity. The wells are equipped with a backup generator, as summarized in Table 6.

When maximum day demand reaches 80-percent of the firm production capacity, the Michigan Department of Environment, Great Lakes, and Energy (EGLE) typically recommends planning for supply expansion. Currently, the firm production capacity is 1.08 mgd and the projected maximum day usage for the year 2042 is 0.326 mgd, far less than 80-percent of the system's firm capacity. However, the City should continue to monitor water usage.

3.2 Water Treatment

The water supplied by the City of Bronson distribution system meets all regulations established in the State of Michigan Safe Drinking Water Standards. Prior to entering the distribution network, the raw well water is treated with fluoride to help prevent tooth decay, sodium polyphosphate for sequestration of iron, and sodium hypochlorite for disinfection.

3.3 Water Mains

The Bronson water system has a complex network of water mains providing transmission and distribution to its customers. The service area covers approximately 1.4 square miles and is supplied through a water distribution network consisting of approximately 18 miles of water mains ranging from 4 to 14 inches. In Cities of this size, some 8-inch pipe operates as transmission main. An approximate breakdown of the water mains by size is presented in the table below.

Water Main Diameter (inches)	Approximate Length of Water Main (miles)	Percentage of Total (%)
4	3.63	20.7%
6	5.18	29.5%
8	3.54	20.1%
10	2.84	16.2%
12	0.98	5.6%
14	1.39	7.9%
Total	17.60	100%

Source: GIS Database.

A summary of water main age is provided in the following table and in Figure 4. Approximately 75% of the system is more than 40 years old. The existing main is primarily cast iron, with some ductile iron and very little asbestos cement pipe. An approximate breakdown of water main material is included below and in Figure 5.

Year Installed	Approximate Length of Water Main (miles)	Percentage of Total (%)
1930 – 1939	2.79	15.9%
1940 - 1949	0.19	1.1%
1950 – 1959	2.83	16.2%
1960 - 1969	6.11	34.9%
1970 - 1979	1.46	8.3%
1980 - 1989	0.87	5.0%
1990 - 1999	1.64	9.4%
2000 - 2009	1.25	7.2%
2010 - Present	0.40	2.3%
Total	17.60	100%

Water Main Summary by Age

Source: GIS Database.

Water Main Summary by Material

Material	Approximate Length of Water Main (miles)	Percentage of Total (%)
Asbestos Cement	1.7	9.8%
Cast Iron	11.7	66.4%
Ductile Iron	4.2	23.8%
Total	17.60	100.0%

Source: GIS Database.

Several areas which could be improved with addition or completion of transmission looping are indicated on Figure 6, the General Plan, and Figure 7, the Transmission Plan.

The City has had numerous water main breaks since the last reliability study in 2016. Water main breaks are listed below.

Year	Size	Street	Address
2022	4"	South St	South and Shaffmaster Intersection
2022	6"	Grant St	450 Grant St
2021	4"	Easement off N Matteson St	803 N Matteson St
2021	6"	York Street	York and Shaffmaster Intersection
2021	8"	Walker St	122 S Walker St
2021	4"	Corey St	Corey and Lincoln Intersection
2020	4"	Easement off N Matteson St	811 N Matteson St
2019	4"	Compton St	Compton and Douglas Intersection
2019	8"	Walker St	Walker and 1st Intersection
2017	4"	Mowry Ave	229 Mowry Ave
2017	4"	Washington St	232 Washington St
2017	6"	Sherman St	215 Sherman St
2017	6"	Wayne St	733 Grant St
2016	4"	Corey St	Corey and McKinley Intersection
2016	6"	Wayne St	223 Wayne St
2015	4"	Lincoln St	250 N Lincoln St
2015	6"	Roosevelt St	159 Roosevelt St

Water Main Break History

3.4 Storage Facilities

Bronson owns and maintains one elevated storage tank with a 200,000-gallon storage capacity. The tank was constructed in 1960 and is located at the corner of Union Street and Division Street. A summary of the storage facility is provided in Table 7.

The City keeps maintenance records for its storage facility. Inspection and interior and exterior painting dates are also included in Table 7.

3.5 Emergency Interconnections

The City of Bronson has no emergency interconnections to nearby water systems.

4 WATER SYSTEM ANALYSIS

4.1 Water Storage Analysis

Ten State Standards states in Section 7.0.1: "Storage facilities should have sufficient capacity, as determined from engineering studies, to meet domestic demands and where fire protection is provided, fire flow demands."

With the City's desire to provide fire protection to customers, a common practice is to determine the storage needs based on maximum daily demands, maximum hourly demands, and fire

demands. An analysis was performed for these demands with consideration for the firm capacity of the water supply.

Table 8 shows the results of the storage analysis. Under Year 2022 demands, the existing system can provide 2,000 gpm of fire demand for two hours. The system-wide storage was also analyzed for Year 2042 demand projections to determine if additional storage will be required in the next twenty years to adequately supply the future system growth. The storage analysis presented in Table 8 shows that the firm capacity of the existing supply and existing storage are sufficient to provide normal demand (equalization) storage plus 2,000 gpm of fire demand volume for two hours through the Year 2042.

While no requirements exist for fire protection, the Insurance Services Office (ISO) typically rates residential customers with a fire flow of 1,000 to 1,500 gpm and commercial and industrial customers with more flow for full insurance credit. The ISO gives full credit for buildings with fire suppression systems. The following water users have active fire suppression systems:

- Strike Zone (717 E Chicago St)
- G&W Display Fixtures, Inc (404 Union St)
- Douglas Autotech (300 Albers Rd)
- M&M Core (300 Mill St)
- Adapt (505 W Chicago)

The industrial and commercial buildings without fire suppression systems would need to provide their own storage to obtain full insurance credit.

4.2 Distribution System Analysis

The City of Bronson Water Supply System network was analyzed using the water distribution software WaterGEMS. This software combines the ability to perform complex hydraulic computations and the ability to present results in a graphical format through its interface with AutoCAD or ArcGIS. Model input data consisted of the following: lengths, diameters, and roughness factors (Hazen-Williams coefficients) for pipes, ground elevations and demands for nodes, and storage tank elevations and volumes.

4.2.1 Model Development

The existing WaterCAD model was updated to WaterGEMS and includes recent water system improvements. Demands were entered into the model using the projections based on population growth and water use data.

To calibrate the model, hydrant testing results were used. A hydrant flow test measures the distribution capabilities of a system by measuring and comparing the static pressure at a given location under typical conditions and the residual pressure at that same location for a given hydrant flow. The test data provides information for model calibration; that is, model parameters can be adjusted so that predicted results compare favorably to measured results. In addition, the test data can provide information to determine locations at which a valve might be partially closed, or locations at which an unknown connection could exist.

The City performed eight fire hydrant flow tests with Prein&Newhof personnel on November 8, 2021. The results of these tests are shown in Table 9. The tests were performed using American Water Works Association (AWWA) test procedures at a variety of locations dispersed throughout the system and provide data to adjust roughness coefficients and demands to simulate results.

Using the hydrant test data, the model was calibrated as follows:

- Simulate system conditions using initial assumptions for parameters
- Adjust water main roughness coefficients and system demand distribution
- Perform a sensitivity analysis on adjusted results
- Fine tune results based on previous steps

Table 10 compares the calibrated model results at the nearest model node to the field test results at the test hydrant sites. Tank levels and pump flows were also recorded during the hydrant tests.

The model reasonably simulates the hydrant test results. Static and residual pressures are within 2 psi at all hydrant test locations. In general, the calibration results are relatively accurate. Given that hydrant model simulations cannot account for fluctuations in demands, the calibration results are considered reliable.

4.2.2 Existing System

Using the calibrated model, simulations were performed for various demand conditions. Resulting pressures were reviewed to determine the adequacy of the system under high demand. Pressures during non-emergency conditions should not fall below 35 psi, nor should pressures in the system exceed approximately 90 psi.

The available fire flow is generally the standard by which a system is measured since that is typically the highest demand experienced. The available fire flow represents the flow available at a given location without creating a low pressure problem anywhere in the system. The minimum system pressure which should be maintained at all times is 20 psi. While recommended fire flows vary based on many factors, the generally suggested fire flows are 1,000 to 1,500 gpm for residential customers, 2,500 gpm for commercial customers, and 3,500 gpm for industrial customers.

Table 11 provides results of simulations for existing conditions. This table shows the results for average day and maximum day pressures and the available fire flow. The locations shown represent a cross-section of areas across the Bronson water system as well as critical areas and noted areas of concern.

Results indicate that pressures are greater than the desired 35 psi throughout the whole system. In some areas, the available fire flows are less than suggested due to insufficient transmission main looping, undersized distribution main, or dead-end mains. Some areas served by older 4-inch or 6-inch diameter mains cannot achieve the recommended suggested fire flow of 1,000 gpm for residential areas, while other areas cannot achieve the recommended 2,500 gpm to 3,500 gpm fire flow for commercial and industrial areas, respectively.

Appendix B includes output of the model results.

4.2.3 Future Conditions

Using the model, simulations were performed for Year 2027 and Year 2042 conditions to determine where improvements to the existing infrastructure may be needed. All water main Hazen-Williams coefficients were reduced by five for Year 2027 and by another five for

Year 2042 to simulate aging. Resulting pressures and available fire flows were reviewed to determine the adequacy of the existing system under future demands.

Table 12 provides a summary of model results with Year 2027 demands and the existing infrastructure, and Table 13 provides a summary of model results with Year 2042 demands and the existing infrastructure. The results indicate that pressures would still be adequate throughout the whole system, but the available fire flows will be further reduced from existing fire flow capabilities because of the additional demands on the system from the projected growth of the service area over the twenty-year period. As a result, potential improvements were analyzed to improve the fire protection in some locations. Figure 6, the General Plan Map, shows the areas within the system modeled as having less than recommended available fire flow under maximum day demands.

4.2.4 Distribution System Improvements

Based on the results of the existing system analysis with future demand projections, improvement alternatives were considered. Several alternatives were considered and then selected and prioritized based on the most cost-effective alternatives to enhance fire protection and overall service. Each of the following improvements would provide improved reliability of flow to the system as well as increase available fire flows.

4.2.4.1 Low Fire Flow Areas

Anderson Elementary School

The service area on Corey Street and Lincoln Street is located next to an elementary school. There are no hydrants located on the school property and the hydrant closest to the school has less than 1,000 gpm available fire flow. The existing 4-inch main on Corey Street from South Matteson Street to Jackson Street is old and undersized. This main should be upsized to 8-inch main. Additionally, this new 8-inch main should be extended and connected to the existing 6-inch main on Wayne Street. This project would increase the available fire flow at the school to over 3,000 gpm meeting the recommended 2,500 gpm for commercial/school users.

Douglas Street and Grant Street Dead Ends

The dead end of Douglas Street south of Compton Street has lower than suggested fire flow. A transmission loop is recommended to connect Ruggles Street, Douglas Street and Grant Street. The project includes constructing 1,340 feet of 10 inch main from the dead end of Grant Street (west of Walker Street) to the Ruggles Street and Rudd Street intersection, as well as to the dead end of Douglas Street South of Compton Street. This project will not only increase fire flows but will also close the loop of the transmission main in this area.

Industrial Avenue

The available fire flow along Industrial Avenue does not meet the suggested 3,500 gpm under existing and future conditions. The water main dead ends with the road east of an 8-inch water main connection from Raymond Street. In order to achieve the recommended available fire flow (and provide for water supply redundancy as discussed in section 5.1.2 below) it is recommended to construct new 12-inch transmission main from the dead end of Industrial Avenue to Well #5.

Wayne Street Dead End/Bronson Junior and Senior High School

The area around the Bronson Junior and Senior High School (near intersection of Grant Street and Wayne Street) has less than the suggested fire flow of 2,500 gpm for commercial/school users. The construction of an 8-inch loop from the dead end of Wayne Street to the dead end of Walnut Street south of Grant Street would provide improved system reliability as well as increase the recommended fire flow to 2,500 gpm.

Corey Street East of Matteson Street

Available fire flow at the hydrant on Corey Street between Matteson Street and Cynthia Street is restricted to under 1,000 gpm for existing and future conditions. This hydrant is served by 4-inch mains that were installed in the 1940s. To achieve 1,000 gpm fire flow, it is recommended to replace the 4-inch main on Corey Street with 8-inch main.

Wastewater Treatment Plant

The wastewater treatment plant and area west of Matteson Street has lower than suggested fire flow under existing and future demands. The existing 4-inch main connected to North Matteson Street that loops through the treatment plant area has experienced multiple breaks in the last several years. In order to achieve the recommended available fire flow, replace old and deteriorating main, and provide for water supply redundancy (through transmission main looping as discussed in section 5.1.2 below), it is recommended to construct new 10-inch transmission main from the existing 12-inch main at the intersection of Industrial Avenue and North Matteson Street, through the treatment plant area, to the existing 10-inch main at the intersection of Mill Street and the treatment plant access road.

West Chicago Street Dead End

The dead end on Chicago Street west of Division Street has less than the suggested fire flow under existing and future demands. To achieve the recommended 2,500 gpm of available fire flow for commercial users, it is recommended to replace the existing 6-inch main on Chicago Street from west of Division Street to the dead end with 8inch main.

4.2.4.2 Old and Deteriorating Mains

The following improvements to the distribution network are recommended for added reliability and to replace old and deteriorating mains. These projects have been taken from the Capital Improvement Plan and are improvements primarily to existing 4-inch and 6-inch mains (one 10-inch main is included) installed prior to 1960 which may be deteriorating and restricting flow in some locations.

- Replace 4-inch main with 8-inch main on Mowry Avenue from Rudd Street to Chicago Street and on Shaffmaster Boulevard from Chicago Street to Union Street.
- Replace 4-inch main with 8-inch main on South Street from Division Street to Ruggles Street.
- Replace 4-inch main with 8-inch main on Douglas Street from the dead end south of Compton Street to Union Street and on Franklin Street from Ruggles Street to Douglas Street.

- Replace 4-inch main with 8-inch main on Walker Street from York Street to Railroad Street.
- Replace 4-inch main with 8-inch main on State Street from Douglas Street to Matteson Street, constructing new 8-inch main on State Street from Walker Street to the existing 8-inch dead end east of Walker Street
- Replace 6-inch main with 8-inch main on Railroad Street from Douglas Street to Matteson Street.
- Replace 4-inch main with 8-inch main on Corey Street from Matteson Street to Jackson Street. Construct new 8-inch main on Corey Street from Jackson Street to Wayne Street.
- Replace existing 10-inch main with new 10-inch main on Railroad Street between Buchanan Street and Winona Street.
- Replace 4-inch main with 8-inch main on Buchanan Street from Chicago Street to Railroad Street.
- Replace 4-inch main with 8-inch main on Winona Street from Chicago Street to Railroad Street.
- Replace 4-inch main with 8-inch main on Washington Street from Chicago Street to Railroad Street.
- Replace 4-inch main with 8-inch main on Lincoln Street from Chicago Street to Fillmore Street.
- Replace 4-inch main with 8-inch main on Fillmore Street from Washington Street to Sherman Street.
- Replace 4-inch main with 8-inch main through property between Matteson Street and Corey Street (around City Hall).

4.2.4.3 Dead End Mains

Whenever possible, dead-end mains should be looped. Water tends to become stagnant in dead end mains, often affecting the quality of water provided to nearby customers. Thus, whenever feasible, dead-end mains should be removed by closing loops, thereby improving the circulation of water and adding reliability. Additionally, removing dead ends will also improve fire protection by providing a second supply route for distribution to the area.

Several of these have been addressed as projects in Section 4.2.4.1. Some other locations include the following:

- Dead end of Walker Street (480 feet of 8-inch main connecting to Matteson Street).
- Dead end of Chicago Road (1,700 feet of 8-inch main on Albers Road connecting to Union Street). Replace existing 6-inch main on Chicago Street with 8-inch main from the existing dead end to Division Street.
- Dead end of State Street west of Matteson Street (250 feet of 8-inch main connecting to Walker Street).
- Dead end north of Washington Street and Railroad Street (620 feet of 8-inch main connecting to Lincoln Street and Raymond Street).
- Dead end on Raymond Street east of Sherman Street (820 feet of 8-inch main connecting to existing dead end just north of Matilda Street and Railroad Street). Also close loop from intersection of Matilda Street and Railroad Street to intersection of Fillmore Street and Sherman Street (730 feet of 8-inch main).

Model simulations were performed with potential improvements included. Results for Year 2027 demands and short-term recommended improvements are included in Table 14. Simulation results with all the recommended improvements for Year 2042 demands are summarized in Table 15. The General Plan in Figure 6 shows areas with less than recommended fire flow as well as short-term and long-term recommended improvements through 2042.

Results show that the available fire flows throughout the system with the improvements meet the general suggestions for fire protection. All model input and output is included in Appendix B, which also includes a map showing node numbering in the model. Appendix C provides pressure contours in the system both under maximum day demands and 1,000 gpm of fire flow.

5 RELIABILITY ISSUES

5.1 Redundancy

Redundancy in the water distribution system ensures the City can maintain a desired level of service even in the event of an emergency, water main break, or planned system maintenance.

Key aspects of system redundancy include a looped water transmission system and backups for critical distribution system components such as pumps and storage.

5.1.1 Water Supply

Two wells are available to supply water to the distribution system, so one well can go out of service without losing water supply.

5.1.2 Water Transmission

It is important that the transmission system has redundancy via looping from the water treatment plant to storage tanks in case of an emergency such as a water main break.

Currently, only a single 14-inch transmission main conveys water from the wells to the distribution network. The operation and maintenance of the main from the wells is critical because the main transmission line is not adequately looped. Water would not have sufficient means to reach the remaining distribution network if the transmission main failed. The Industrial Avenue project described in Section 4.2.4.1 would provide the system with the second transmission path from the wells and the redundancy to provide for improved system reliability.

The Wastewater Treatment Plant project will close a gap in the transmission main loop on the north side of the City in order to provide improved system reliability. This project is described in Section 4.2.4.1 as it will increase available fire flow to an area that does not currently meet the recommended fire flow rate.

Other potential locations for closing transmission loops in the Southeast corner of the City include the following:

- Wayne Street from Grant Street to Chicago Street
- Intersection of Grant Street and Walnut Street to the intersection of Chicago Street and Parham Road
- Parham Road from Chicago Street north to the existing 14-inch transmission main

The Transmission Plan map (Figure 7) shows transmission main improvements that are being planned in the City's new Capital Improvement Plan as well as several alternatives for future longer-term projects (beyond 20 years) which would fully close transmission loops.

5.1.3 Storage

Bronson's water system currently has 0.20 million gallons of storage in one storage tank. The system does not have adequate redundancy if the tank is out of service.

5.1.4 Backup Power

Well #5 is served by a portable 750 gpm diesel generator. The generator can be used at either well but is currently assigned to Well #5. Standby power capacity for each well is provided in Table 6.

5.2 Water Quality

The City performs bacteriological, chemical, lead and copper, and radiological monitoring of the finished water and has had no health-based maximum contaminant level (MCL) exceedances. The City had one violation of total coliform levels in 2010 which was quickly resolved. The Annual Water Quality Report is included in Appendix D.

5.2.1 Per- and Polyfluoroalkyl Substances (PFAS)

Per- and Polyfluoroalkyl Substances (PFAS) have been a recent focus in drinking water as well as other environmental sectors as a group of man-made chemicals that are not easily destroyed in the environment and are not easily removed in treatment. Many of the chemicals in the PFAS group have been identified as having increased health risks at relatively low levels in drinking water.

In June 2022, the Environmental Protection Agency (EPA) updated its 2016 Health Advisory (HA) for PFOA and PFOS of 70 parts per trillion (ppt). The interim lifetime HAs for PFOA and PFOS were lowered to 0.004 ppt and 0.02 ppt, respectively. New final HAs for GenX Chemicals and PFBS were also established in June 2022, at 10 ppt and 2,000 ppt, respectively. The interim and final HAs are not compliance requirements for water systems. Additionally, the current laboratory detection limits are in the range of 2 ppt, well above the new interim HA for PFOS and PFOA. It is anticipated the EPA will be considering federally established MCLs in the coming years. Due to the lack of federally established maximum contaminant levels (MCLs), the regulatory landscape varies across state lines and is frequently shifting. Effective August 2020, Michigan established regulatory MCLs for six PFAS chemicals through amendment to the Michigan Safe Drinking Water Act. Community

water supplies are now required to sample finished water for PFAS, and many water supplies also participate in sampling of untreated/raw water for study purposes.

The City of Bronson water supply was tested in June 2021. Results show that the total tested PFAS (PFOA plus PFOS) were non-detect in each case. The report from the PFAS testing is included in Appendix E.

5.3 Deteriorating Mains

Pipe suppliers indicate that water main is expected to last more than 100 years. However, depending on the material, design parameters, soils, proper construction, water chemistry, and associated breaks that occur etc., a pipe may need to be replaced sooner. Thus, the condition of water main should be observed and tracked. When necessary, water main should be replaced for improved system reliability. Section 3.3 lists the recent water main breaks and should be on the list for replacement when possible.

Approximately 50-percent of the water system was constructed prior to 1960. Operators should document signs of main deterioration when possible and deteriorating water mains should be replaced in conjunction with other street or utility projects.

5.4 General Maintenance

The water distribution system and its assets are maintained by Bronson. General maintenance of equipment and facilities enhances overall system reliability.

5.4.1 Flushing Program

Hydrant flushing is performed in the spring and the fall, and every hydrant is operated. City personnel inspects all hydrants and identifies necessary repairs during hydrant flushing. The City keeps records of hydrant activities. Hydrant flushing allows stagnant water to be discharged from the system, improving reliability of water quality.

5.4.2 Valve Exercising Program

The City currently follows a formal valve exercising program. The program enhances the reliability of the system and improves public protection. The City maintains a schedule/checklist to track the progress of the routine maintenance. It is recommended that the City continues this program and updates its valve records to include specific information

for individual valves. This valve information should include the following: ID, location (with witness points), type, size, normal operating status (open or closed), condition, direction of turn, number of turns, and date of last inspection.

5.4.3 Meter Testing Program

The City is in the process of replacing 100-percent of the water meters to radio-read meters. After completing the meter replacement project, the City should develop a systematic program to help maintain accurate customer billing and to capture all system revenue. The City should test/calibrate/change-out meters within a 15-to-20-year period.

5.4.4 Cross Connection Program

The City has a well-documented cross connection program for commercial and industrial customers. The program is in accordance with the EGLE rules and regulations, including following report requirements. The program includes installation of backflow prevention devices, site protection through containment and isolation, testing of backflow prevention devices, and facility inspections.

5.4.5 Well and Pump Inspections Program

The City has a thorough well-inspection program, completing the review on an annual basis. Peerless Midwest Inc. has recently completed the inspection for 2022. Reports from the past three years are included in Appendix F.

5.4.6 Water Shortage Response Plan

The City has a Water Shortage Response Plan which provides many details, including current contact information, critical customers, and water hauler contact information. The Plan was updated in 2022 and is included in Appendix G.

5.4.7 Water Accountability Plan

The City should develop and implement a water accountability plan to account for unbilled water usage. Unbilled sources of water use should be estimated, including water used during hydrant flushing, fires, main leakage, and street sweeping, as well as others.

Water loss within the range of 10 to 15-percent is considered to be average for comparable water distribution systems. In the past five years, the City has averaged 16% of water

pumped from the wells that is unaccounted for and unbilled, as shown in Figure 8 and in the table below.

Year	Pumped Volume (Gal)	Metered Volume (Gal)	Unaccounted Water ¹ (Gal)	Percent Loss
2017	56,471,000	50,888,515	5,582,485	10%
2018	64,698,000	50,820,552	13,877,448	21%
2019	59,083,000	49,303,578	9,779,422	17%
2020	59,647,000	48,491,868	11,155,132	19%
2021	57,575,000	48,789,583	8,785,417	15%
Average	59,494,800	49,658,819	9,835,981	16%

Water Accountability

6 **RECOMMENDATIONS FOR IMPROVEMENTS**

The following categories of improvements to the Bronson Water System were used to prioritize the recommended system improvements.

Improvements to Address Problems with Existing Infrastructure

- Comply with Federal and State Regulations
- Improve general level of service
- Improve redundancy of transmission

Improvements Required to Expand Service for Projected Growth

- Improvements to existing infrastructure to serve new areas
- Improvements which would enhance the level of service

Recommendations have been separated into projects and general improvements based on the above criteria and demand projections. Recommendations developed herein are intended to improve the overall supply and increase available fire flows to customers. These projects should be completed in conjunction with road projects, when possible.

6.1 Recommended Projects

- Project 1: Replace approximately 2,700 feet of 4-inch main and 6-inch with 8-inch main on Shaffmaster Boulevard and Mowry Avenue from Rudd Street to Union Street,
- Project 2: Replace approximately 900 feet of 4-inch main with 8-inch main on South Street from Division Street to Ruggles Street.
- Project 3: Replace approximately 2,300 feet of 4-inch main with 8-inch main on Douglas Street from the dead end south of Compton Street to Union Street.
- Project 4: Replace approximately 300 feet of 4-inch main with 8-inch main on Franklin Street from Douglas Street to Ruggles Street.
- Project 5: Replace approximately 1,400 feet of 4-inch main with 8-inch main on Walker Street from York Street to Railroad Street.
- Project 6: Replace approximately 1,100 feet of 4-inch and 6-inch main with 8-inch main on State Street from Ruggles Street to Matteson Street (portion of length is new watermain where it currently does not exist).
- Project 7: Replace approximately 1,100 feet of 6-inch main with 8-inch main on Railroad Street from Ruggles Street to Matteson Street
- Project 8: Replace approximately 500 feet of 10-inch main with new 10-inch main on Railroad Street from Buchanan Street to Winona Street.
- Project 9: Replace approximately 1,800 feet of 4-inch main with 8-inch main on Buchanan Street from Chicago Street to Railroad Street.
- Project 10: Replace approximately 1,700 feet of 4-inch main with 8-inch main on Winona Street from Chicago Street to Railroad Street.
- Project 11: Replace approximately 1,600 feet of 4-inch main with 8-inch main on Washington Street from Chicago Street to Railroad Street.
- Project 12: Replace approximately 1,200 feet of 4-inch main with 8-inch main on Lincoln Street from Chicago Street to Fillmore Street.

- Project 13: Replace approximately 700 feet of 4-inch main with 8-inch main on Fillmore Street from Washington Street to Sherman Street.
- Project 14: Replace approximately 2,700 feet of 4-inch main with 8-inch main on Corey Street from Matteson Street to Wayne Street (portion of main from Jackson Street to Wayne Street is new watermain where it currently does not exist).
- Project 15: Replace approximately 800 feet of 4-inch main with 8-inch main behind City Hall and business between Matteson Street and Corey Street
- Project 16: Construct approximately 500 feet of new 8-inch main from the dead end of Walker Street to Matteson Street.
- Project 17: Construct approximately 1,000 feet of new 8-inch main from Wayne Street to the intersection of Grant Street and Walnut Street.
- Project 18: Construct approximately 1,600 feet of new 8-inch main on Fillmore Street from Sherman Street to Matilda Street, on Matilda Street from Fillmore Street to Raymond Street, and on Raymond Street from Matilda to Sherman Street.
- Project 19: Construct approximately 600 feet of new 8-inch main from the intersection of Lincoln Street and Raymond Street to the ex. 6inch watermain dead end north of intersection of Railroad Street and Washington Street.
- Project 20: Construct approximately 1,700 feet of new 8-inch transmission main on Albers Road from Chicago Street to Union Street.
- Project 21: Replace approximately 500 feet of 6-inch main with new 8-inch transmission main on Chicago Street from west of Albers Street to west of Division Street.
- Project 22: Construct approximately 1,350 feet of new 10-inch transmission main from the intersection of Rudd Street and Ruggles Street to the dead end of Grant Street west of Walker Street, then to the dead end of Douglas Street South of Compton Street
- Project 23: Construct approximately 2,200 feet of 10-inch transmission main through the Wastewater Treatment Plant property from the Industrial Avenue and Matteson Street intersection to the Mill Street and treatment plant access road intersection.

Project 24: Construct approximately 3,200 feet of new 12-inch transmission main from Well #5 to the ex. 12-inch transmission main dead end on Industrial Avenue.

6.2 General Recommendations

6.2.1 Dead End Mains

Whenever possible, dead-end mains should be removed by closing loops, thereby improving the circulation of water and adding reliability. Additionally, removing dead ends will also improve fire protection by providing a second supply route for distribution to the area. Several projects described in Section 6.1 are recommended in order to eliminate dead ends.

6.2.2 Reliability Study

Update the Water System Reliability Study within five years. Given the uncertainty of growth, demand projections should be reviewed periodically.

6.2.3 Water Quality

The City should continue to monitor water quality and proceed with lead service line replacement regulations.

6.2.4 Flushing Program

The City should continue to implement the spring and fall flushing program and make modifications based on its effectiveness to ensure all hydrants are operable and in good condition.

6.2.5 Valve Exercising Program

The City currently has a formal valve exercising program. Once a year, while the hydrants are flushed, the City practices valve turning to enhance reliability of the system and to improve public protection. The City should continue its valve exercising program.

6.2.6 Water Accountability Plan

The City should develop and implement a water accountability plan to account for unbilled water usage. Unbilled sources of water use should be estimated, including water used during hydrant flushing, fires, main leakage, and street sweeping, as well as others. Continuous

tracking and development of the program is recommended as results may signal whether a source of lost revenue exists and may ultimately help identify the source.

6.2.7 Meter Testing Program

The City should implement a meter testing and change-out program to help maintain accurate customer billing and to maximize system revenue. While every system can be different, the typical recommended testing/calibration/change-out period for commercial meters is every 3 years, and 15 to 20 years for residential meters.

6.2.8 Cross Connection Program

The City should continue with its cross-connection program and upgrade efforts to continue meeting the cross-connection control standards as outlined by EGLE.

6.2.9 Replace Older Mains

As operators observe water mains to be deteriorating, such as experiencing significant main breaks or tuberculation, they should be considered for replacement in conjunction with other street and utility projects.

6.2.10 Well Inspections Program

The City should continue with the annual well inspection program including performing annual well pump efficiency testing.

6.2.11 Water Shortage Response Plan

The City has developed a Water Shortage Response Plan for use in the event of a water shortage emergency. The City should continue to update the plan as needed to maintain preparedness in case of emergency. The Water Shortage Response Plan is included in Appendix G.

6.2.12 Water Supply Capacity

If, and when, water system demands approach 80% of the firm supply capacity, the City should investigate additional water supply alternatives.

7 COST OPINIONS

An Opinion of Project Costs has been prepared for each project. Costs for projects of similar size and scope that have been constructed in southwest Michigan were reviewed for relevant information.

The Cost Opinions have been prepared including an allowance of approximately 35% above the estimated construction cost. This allowance is intended to include the cost of construction contingencies (issues which are presently unknown), legal fees, engineering design and construction services (including preliminary and final design, soil borings, topographic survey, bidding assistance, construction staking, compaction testing, construction inspection and project administration during the entire project) and administrative expenses related to the project.

It has been assumed that land is available for construction of the described improvements. No provision has been made in the cost estimate for cost of land or right-of-way purchase or easements.

Cost Opinions for recommended projects are included in Table 16.

Appendix B

2019 Asset Management and Capital Improvement Plan (excerpts)



City of Bronson, Michigan

Water System Asset Management Program

Executive Summary

November 2017

(Updated May 2019)

Asset Management Team:

The City of Bronson asset management team consisted of the following people:

Name	Employer	Title
Mike Engels	Michigan Rural Water Association	Circuit Rider
Chuck Buckley	City of Bronson	Utilities/DPW Director
Brandon Mersman	City of Bronson	City Manager

This report contains the asset management program for the City of Bronson water system.

Description of water system: The City of Bronson is located in Branch County in Southwestern Michigan. The City relies on two wells, referred to as Well No. 4 and Well No. 5, also known as North and South Well. These wells were constructed in 1960 with a permit capacity of 750 gpm. The City of Bronson then conveys water to their customers through a complex network of transmission and distribution mains.

The water system contains approximately 17.3 miles of water main.

There are two (2) wells that supply the system with water.

The City has one elevated storage tank with a capacity of: 200,000 gallons.

Numerous Non-Pipe Assets (equipment, vehicles, water treatment components, etc.)

City of Bronson population: 2,349

Number of customers connected to the water system: 1,005

Average daily gallons used: 146,151

Type of treatment: D-3 and S-3
Conclusion

The results of the asset management program user fee rate analysis indicated that a slight water rate increase was necessary to meet the adopted budget. At the August 14, 2017 City Council meeting the City Council adopted new water rates. The cost per 1,000 gallons was raised from \$1.30 to \$1.38 which was slightly less than the rate study; however, base capacity rates were increased above the amount recommended by the rate study. A higher base capacity charge was implemented in order to ensure the system is collecting enough needed revenue regardless of water usage. The increase was put in place to better fund the water system's infrastructure depreciation and to generate funds for future improvement projects.

See Appendix C for the water rate resolution which indicates that the rates listed below are consistent with rates that were adopted.

BRONSON WATER						
	CONCLUSIC	ON OF ANALYSIS				
COST PER	CURRENT RATES CALCULATED RATES DIFFERENC					
1,000 GAL.	\$1.30	\$0.10				
	CURRENT "BASE RATE" CHARGE MONTH					
METER SIZE - INCHES	CURRENT RATES	CALCULATED RATES	DIFFERENCE			
3/4	\$14.25	\$14.70	\$0.45			
1	\$35.63	\$36.75	\$1.12			
1 1/2	\$71.25	\$73.49	\$2.24			
2	\$114.00	\$117.58	\$3.58			
3	\$213.75	\$220.46	\$6.71			
4	\$356.25	\$367.43	\$11.18			
6	\$712.50	\$734.87	\$22.37			

The above rates are based on an input budget of

\$276,127 53,345,385 1,005

The above rates are based on invoicing the following gallons of water / sewer

The above rates are based on the following number of customers The above rates are based on the following number of Residential Equivalent Units (REU's) 13,692

CALCULATED RESULTS OF WATER RATE ANALSYSIS 2017						
BRONSON WATER	ANNUAL BUDGET	BASE RATE FIXED EXPENSES	COST PER 3/4 METER	CONSUMPTION VARIABLE EXPENSES	COST / UNIT OF WATER	
LABOR & BENEFITS	\$122,631	\$92,096	\$6.73	\$30,535	\$0.57	
OPERATION & MAINTENANCE EXPENSES	\$78,520	\$58,890	\$4.30	\$19,630	\$0.37	
		\$0	\$0.00	\$0	\$0.00	
ASSET REPLACEMENT & REHAB SHORT LIVED ASSETS 0-15 YEARS	\$29,976	\$17,986	\$1.31	\$11,991	\$0.22	
CONTINGENCY / CAPITAL		\$0	\$0.00	\$0	\$0.00	
CAPITAL IMPROVEMENT PROJECTS	\$45,000	\$32,265	\$2.36	\$12,735	\$0.24	
ADOPTED BUDGET AS RESULT OF AMP	\$276,127	\$201,237	\$14.70	\$74,891	\$1.40	
		73%		27%		
CALCULATED RATE PER 3/4 M	PER	MONTH	¢ 1/1 70	1,000 GAL.	¢ 1 /0	
			<u>ə 14.70</u>		<u>\$ 1.40</u>	
TOTAL ANNUAL <u>EQUIVALENT</u> REU'S	13,692	CURRENT RATES	\$14.25		\$1.30	
ANTICIPATED WATER/SEWER SOLD 53,345,385		INCREASE OF	\$0.45		\$0.10	
RESERVE PORTION OF BUDGET 27%						
INVOICES PER YEAR 12 EVERY MILLION GALLONS GENERATES REV				IS GENERATES REVENUE OF	\$1,404	
IS BASE RATE PER REU, - OR PER METER SIZE?	METER SIZE	\$1.00 INCREASE GENERAT	\$13,692		\$53,345	

The rate study was conducted with the assistance of the Michigan Rural Water Association in February of 2017.

CONFIRMATION OF INCOME

The table below breaks down the revenue generated from the new water rates in the rate study:

The Rate Study in its entirety is attached in Appendix B.

CONFIRMATION OF INCOME - BASED ON CALCULATED RATES

BRONSON WAT	BRONSON WATER						
	BRONSON WATER	TRAILER PARK	FEDERAL HOUSING FACILITY	REVENUE			
	New Cost per Unit of Water Sold			NEW RATES			
PER 1,000 GAL.	\$1.40	\$1.40	\$1.40				
UNITS Sold	49,221	1,519	2,605	53,345			
Income	\$69,101	\$2,133	\$3,657	\$74,891			
PERCENT WATER SOLD	92%	3%	5%				
PERCENT REVENUE	92%	3%	5%				
NON SALES INCOME APPLIED TO VARIABLE BUDGET							
	TOTAL ANTICIPATE	D REVENUE P	ER UNIT SALES	\$74,891			
METER SIZE							
3/4	\$14.70	\$11.02	\$11.02				
	904	28	48				
INVOICES BER YEAR	12	12	12				
	10.848	336	576				
	\$159.437.08	\$3,703,74	\$6.349.26	\$169.490			
1	\$36.75	\$27.56	\$27.56	÷100,100			
NO. CUSTOMERS	6	0	0				
INVOICES PER YEAR	12	12	12				
ANNUAL INVOICES	72	0	0				
INCOME	\$2,645.90	\$0.00	\$0.00	\$2.646			
1 1/4	\$0.00	\$0.00	\$0.00	• ,			
NO. CUSTOMERS	0	0	0				
INVOICES PER YEAR	12	12	12				
ANNUAL INVOICES	0	0	0				
INCOME	\$0.00	\$0.00	\$0.00	\$0			
1 1/2	\$73.49	\$55.12	\$55.12				
NO. CUSTOMERS	12	0	0				
INVOICES PER YEAR	12	12	12				
ANNUAL INVOICES	144	0	0				
INCOME	\$10,582.11	\$0.00	\$0.00	\$10,582			
2	\$117.58	\$88.18	\$88.18				
NO. CUSTOMERS	5	0	0				
INVOICES PER YEAR	12	12	12				
ANNUAL INVOICES	60	0	0				
INCOME	\$7,054.74	\$0.00	\$0.00	\$7,055			
3	\$220.46	\$165.35	\$165.35				
NO. CUSTOMERS	1	0	0				
INVOICES PER YEAR	12	12	12				
ANNUAL INVOICES	12	0	0				
INCOME	\$2,645.53	\$0.00	\$0.00	\$2,646			
4	\$367.43	\$275.58	\$275.58				
NO. CUSTOMERS	U 10	U 10	U 10				
INVOICES PER YEAR	12	12	12				
ANNUAL INVOICES	U	U	U				
INCOME	\$0.00	\$0.00	\$0.00	\$0			
0	\$/34.8/	ຈວວາ.15	ຈວວ1.15 				
NO. CUSTOMERS	10	10	10				
INVOICES PER YEAR	12	۱ <u>۲</u>	0				
ANNUAL INVOICES	12	0	0	¢0.010			
INCOME	\$ 8 ,818.42			\$8,818			
	\$201,237						
101	AL COMDINED CUSTOMER INCOME :	- DAGERATE + V	OLOME INCOME	φ210,121			
	TAT			¢076 107			
	TOTAL	COMBINED CUS		\$276 127			
			Difference	<u>φ210,121</u> ¢Ω			
L			Difference	ψU			

<mark>Inventory</mark>

Appendix A contains a list of assets that the City maintains and tracts. The water system asset inventory will be tracked in a <u>Microsoft excel spreadsheet file and on the City's Asset Management Software (Mobile 311)</u> which is tied to the City's GIS.

The <u>Director of Public Works</u> will maintain the file and make changes to the inventory as needed. The inventory file will be kept on the computer in the DPW Directors office as well as the City Manager's computer located in City Hall. The file will also be backed up by the City's IT service provider.

The inventory will be updated as system improvements are made and / or at the end of each fiscal year.

The following assets are tracked:

- 2 City wells We will maintain GIS locational data on each well in our system. Other well data such as depth, diameter, capacity, and installation dates will also be maintained.
- 1 Elevated Water Storage Tower We will maintain GIS data on our tower in our system. Data such as height, capacity, installation date, and coating dates will also be maintained.
- Main valves, fire hydrants, water meters, and curb stops (locations are mapped on GIS system)
- Water Main We will maintain data on pipe materials, installation dates, sizes, and any other pertinent information which will assist with our asset management program. Pipe locations are mapped in the GIS system.

The following assets will be tracked moving forward:

- Water mains will be tracked moving forward and data on existing mains will be added over the next year or two. Watermain locations are currently mapped on the City's GIS system. Age and material information for unknown sections of watermain will be added to the system as the information becomes available.
- We will also collect locational data on water services for tap and curb box locations. Other data such as size, material, and installation date will also be documented in our GIS system.
- The City of Bronson water system does employ water treatment with the addition of chlorine, phosphate and fluoride. These items are part of the non-pipe asset and are tracked in EXCEL files by the DPW.
- We will maintain active inventories of assets such as trucks, loaders, generators, backhoes, or any
 other functionally or financially significant assets. Informational data such as manufacture date,
 purchase price, maintenance budget, and warranty information will be tracked.

Asset Management Tracking

The City of Bronson has already begun to track Asset Management Inventory using Asset Management Software through Mobile 311. All water system staff members are equipped with mobile devices with Mobile 311 software to document inventory and track system improvements or system issues. City staff will continue to improve on this usage making it an integral part of their jobs. The City will work to improve upon the current data we have on existing infrastructure over the next few years. The software is also used to record and track valve exercising, preventative maintenance and hydrant flushing.

Identify and Replace Lead/Galvanized Water Services

We will maintain our water chemistry to minimize the corrosion potential in the various water service materials.

We will implement a program to identify and locate the types of service lines in our system and prepare a logistical plan, timeline, and budget for replacing the lead and galvanized metal services within the public portions of system. Services will be replaced when road replacement projects or work on other assets impact the immediate area where lead/galvanized services are known to exist. Such projects are identified in our Capital Improvement Plan.

Through a public education program, we will encourage all members of our community to replace those types of water lines on the private property portions of those services and within their homes/businesses.

When the water system is altered, either by construction of new assets or rehabilitation/replacement of existing assets, we will maintain records of each water project in our GIS system.

The following notes major activities for lead /galvanized service replacement:

January 1, 2020	Desk-Top inventory of available records to create inventory
January 1, 2020 thru December 31, 2050	Replace services in conjunction with other infrastructure projects
January 1, 2025	Field verification of unknown services for final inventory

The goal of the City is to replace all lead/galvanized services over a 30-year period. The amount replaced each year will fluctuate based on other infrastructure projects. The intention is to perform "corridor" improvements (water, sewer, storm, road, etc.) at the same time to minimize disruption to the project areas and residents.

Overall summary of the water system assets

WATER SYSTEM ASSETS ESTIMATED VALUE - AT DATE OF EVALUATION

	REPLACEMENT	AVERAGE PERCENT
	COST	OF LIFE REMAINING
WATER DISTRIBUTION MAINS	\$16,839,000	68%
WATER DISTRIBUTION VALVES	\$305,600	67%
FIRE HYDRANTS	\$444,000	22%
WATER STORAGE	\$1,222,000	54%
EQUIPMENT REPLACEMENT	\$629,900	41%
CURB STOPS & WATER METERS	\$221,550	60%
WATER PLANT & OTHER MISC		
ASSETES	\$2,050,000	73%
TOTALS	\$21,712,050	55%

Summary of the water main inventory

WATER DISTRIBUTIO	N PIPE SUMMARY SIZE				
PIPE SIZE	FEET OF PIPE	PERCENT OF TOTAL	\$ PER FOOT	REPLACEMENT COST	
4	17,200	19%	\$175	\$3,010,000	
6	27,600	31%	\$175	\$4,830,000	
8	16,200	18%	\$175	\$2,835,000	
10	15,700	18%	\$175	\$2,747,500	
12	5,300	6%	\$185	\$980,500	
14	6,800	8%	\$185	\$1,258,000	
TOTAL	88,800	100%		\$15,661,000	
	OVERALL AVERAGE COST PER FOOT \$176				

CURRENT YEAR 2017						
WATER DISTRIBUTIO	N PIPE SUMMARY					
PERCENT BASED ON	90					
DATE OF		AGE OF		PERCENT OF LIFE	PERCENT OF LIFE	
INSTALLATION	LENGTH	PIPE	PERCENT OF TOTAL	REMAINING	CONSUMED	
1935	17,200	82	19%	8.9%	91%	
1950	43,800	67	49%	25.6%	74%	
1960	6,800	57	8%	36.7%	63%	
1965	5,300	52	6%	42.2%	58%	
1974	12,300	43	14%	52.2%	48%	
2002	1,300	15	1%	83.3%	17%	
2011	2,100	6	2%	93.3%	7%	
			0%			
TOTAL	88,800		100%			

Future Improvements:

The City is currently working with an engineering firm to draft to comprehensive Capital Improvement Plan for the City. The engineer will work with the City to identify projects and costs of improvement projects for the City's water system. The City engineer and City staff will update our current Water Distribution System Capital Improvement Plan and it will be included in the City's Capital Improvement Plan for all City assets.

The City also plans to submit a grant application for the Infrastructure Capacity Enhancement Grant to improve water distribution systems where it is most needed. Below is a summary of the City's Wells and Water Storage Asset Inventory. The table includes projected replacement costs, each of installation, estimated remaining useful life, critical factory and estimated projected replacement year:

City of Bronson

2	0	1	7
-	~	-	

WATER TOWER ESTIMATED CURRENT VALUE & ESTIMATED REPLACEMENT COST						
City of Bronso	n		1=GO FISHING 25=OMG!	2.0%		
WATER TOWER NAME OR #	YEAR INSTALLED	AGE OF ITEM	ESTIMATED REMAINING LIFE	CRITICAL FACTOR 1-25	ESTIMATED FUTURE REPLACEMENT COST	(ESTIMATED) REPLACE IN YEAR OF
WATER TOWER 1	1960	57	43	12	\$1,136,460	2060
				\$1,136,460		

City of Bronson

2017

<u>WELLS</u> - EST ESTIMATED F	IMATED C REPLACEN	URREN MENT CO	1=GO FISHING 25=OMG!	2.0%			
WELL NUMBER	YEAR INSTALLED	AGE OF WELL	RANKING OF IMPORTANCE AMONG EXISTING WELLS 1= MOST	ESTIMATED REMAINING LIFE	CRITICAL FACTOR 1-25	ESTIMATED FUTURE REPLACEMENT COS [*]	(ESTIMATED) REPLACE IN YEAR OF
WELL 4	1960	57	1	18	14	\$408,000	2035
WELL 5	1960	57	2	18	14	\$544,000	2035
GENERATOR STANDBY	2012	5		25	4	\$49,500	2042
				-			
				TOTAL		1,001,500	

City Wells and Water/Elevated Tower Storage Improvements:

The City will continue to explore and search for new well location sites for the City's long term water needs.

The City's has budgeted \$45,000 for the 2017-2018 fiscal year for water tower inspection and interior painting of the tower.

The following table is a list of the critical asset in the drinking water inventory.

City of Bronson	City of Bronson WATER SYSTEM SUMMARY OF CRITICAL ASSETS									
2017										
ASSET NAME	LOCATION	NOTES & DESCRIPTION	CRITICAL FACTOR TO A COMPONENT OR THE ENTIRE SYSTEM	CRITICAL FACTOR RATING	INSTALLATIO N YEAR	USEFUL LIFE	AGE	REMAINING LIFE	REPLACE IN YEAR OF	PERCENT OF ASSET REMAINING
WELL 4	220 PARHAM	MAIN WELL	ENTIRE SYSTEM	14	1960	75	57	18	2035	24%
WATER TOWER	UNION ST	200,000 GALLONS	ENTIRE SYSTEM	12	1960	100	57	43	2060	43%
GENERATOR STANDBY	KEPT AT WWTP	RUNS BOTH WELL STARTING SUMMER 2017	ENTIRE SYSTEM	4	2012	30	5	25	2042	83%

The three most critical items in the water system are well # 4, the elevated storage tower, and generator standby as these are the only two wells with backup generator power. The generator is also on the critical list. These three critical items are essential to the City's water system. The main well is the City's main source of water for the community. The City's only active water storage system is vital to maintaining the necessary water pressure to prevent low pressure events.

The Asset Inventory included in this report contains the following information:

- a) Brief description of the asset, its required capacity (e.g. pump: 120 gpm), level of redundancy for the asset.
- b) Location of the asset;
- c) Year the asset was installed;
- d) Present condition of the asset (e.g. excellent, good, fair, poor);

The following rating system was used for this report:

Condition	Assessment
Condition Rating	Description
	Asset Unserviceable -
5	Over 50% of asset requires replacement
	Significant deterioration - significant
4	renewal/upgrade required (20 -40%)
	Moderate deterioration -
3	Significant maintenance required (10 -20%)
	Minor Deterioration -
2	Minor maintenance required (5%)
	New of Excellent Condition -
1	Only normal maintenance required

e) Current asset (replacement) costs;

f) Criticality - Consequence of Failure

At the current time, this is the rating system being used for "Criticality, Consequence of Failure" which is slightly different than the MDEQ Water Asset Management suggestion.

Consequence of	Failure *
Performance Rating	Description
5	Catastrophic disruption
4	Major disruption
3	Moderate disruption
2	Minor disruption
1	Insignificant disruption

* consider safety/social, economic/financial, environmental

g) Probability of Failure (POF): FOR WATER MAINS AND VALVES Per MDEQ Guidelines - Probability of failure is rated as follows.

Risk of Failure (Probability of Failure)

Probability of	Failure
Performance Rating	Description
5	Imminent - Likely to occur in the life of the item
	Probable - Will occur several times in the life of an
4	item
	Occasional - Likely to occur some- time in the life
3	of an item
	Remote - Unlikely but possible to occur in the life
2	of an item
	Improbable - So unlikely, it can be assumed
1	occurrence may not be experienced

The following is a quote from the MDEQ Asset Management Guide.

To determine the probability of failure a utility needs to look at a number of factors: asset age, condition of asset, failure history, historical knowledge, experiences with that type of asset in general, maintenance records, and knowledge regarding how that type of asset is likely to fail. Below is an example of a ranking system for probability of failure

For this report Probability of Failure for water mains and water valves is calculated by taking the average of: Percent of life consumed (on a 1-5 scale) Condition of item (on a 1-5 scale)

For items in the equipment replacement pages the Probability of Failure is calculated by taking the average of: Percent of life consumed (on a 1-5 scale) Percent of life until next rehab (on a 1-5 scale) Condition of item (on a 1-5 scale)

h) A Criticality Rating = (Probability of Failure X the Consequence of Failure)

Level of Service

Level of Service (LOS) defines the way in which the utility stakeholders want the utility to perform over the long term. The LOS plan was completed for the City and should become a fundamental part of how the utility is operated, through the setting of practical goals for the City's water system.

This report also contains a Level of Service document which is attached in Appendix A. The Utilities Director and the City Manager will annually review the Level of Service goals and objectives to determine how the City is performing in meeting these objectives. Staff will grade the City's performance to find areas where improvement is needed on these objectives.

Capital Improvement Plan

A capital improvement plan was completed in December of 2015 and will be updated with the City's new Community Capital Improvement Plan. The City is currently setting aside more than **<u>\$60,000 dollars</u>** per year for capital improvement projects. See attached capital improvement plan (Appendix D) for details. The capital improvement program was developed based on a recent reliability study / general plan completed by the City's Engineer, as well as system deficiencies noted by City employees with the goal of saving a 5% - 10% down payment for most projects.

	Opinion of		
Short Term Improvement Project	Probable		
	Project Cost		
1. Install a permanent generator at Well No. 4.	\$30,000		
2. Have both wells and pumps serviced and overhauled to bring them back to design capacity of 750 gpm each.	\$50,000		
3. Perform the maintenance and painting as outlined in the Nelson Report for the elevated storage tank.	\$70,000		
4. Abandoning the 4" main in Douglas Street and connecting the services onto the parallel 10" main. Replacing the 4"			
main with 8" main in State Street from Douglas to Walker and replacing the 4" main in Walker Street with 8" main from			
Union to Railroad Street.	\$127,500		
5. Replace the 4" main with 8" main in Douglas Street from Compton to the south end. (425 LF)	\$42,500		
6. Replace the 4" main in Corey Street with 8" main From Walker Street to Wayne Street. (3,150 LF)	\$315,000		
7. Replace the 4" main in Matteson Street from Grant Street to Park Street and replace the 4" main in Rudd Street			
from Walker to Matteson. (1,025 LF)	\$102,500	* Completed in 20	16
Total	\$737,500		
Notes:			
1. Opinion of Cost includes 25 percent allowance for legal and administrative costs, engineering and contingencies.			
2. The Opinion of Cost is based on 2011 dollars			
3. Does not include water service replacements or extensive restoration.			

	Opinion of
Long Term Improvement Project	Probable
(4-inch water main replacement)	Project Cost
1. Mowry Avenue / Shaffmaster from Compton to Union (2,200 LF plus Bore & Jack)	\$245,000
2. South Street from Division to Ruggles (900 LF)	\$90,000
3. Douglas from Compton to Union (1,850 LF plus Bore & Jack)	\$210,000
4. Franklin Street from Ruggles to Douglas (350 LF)	\$35,000
5. Walker from York to Union (700 LF)	\$70,000
6. Water Main located between Chicago and Corey and between Matteson to Cynthia (700 LF)	\$70,000
7. Buchanan Street from Chicago to Railroad Street (1,800 LF)	\$180,000
8. Winona Street from Chicago to Railroad Street (1,700 LF)	\$170,000
9. Washington Street from Chicago to Railroad Street (1,650 LF)	\$165,000
10. Lincoln Street from Chicago to Filmore Street(1,300 LF)	\$130,000
11. Filmore Street from Washington To Sherman (650 LF)	\$65,000
Total	\$1,430,000
Notes:	
1. Opinion of Cost includes 25 percent allowance for legal and administrative costs, engineerin	g and contingencies.
2. The Opinion of Cost is based on 2011 dollars	
3. Does not include water service replacements or extensive restoration.	

For details on each project see Appendix D for a complete Water Capital Improvement Plan. Appendix E contains City Council meeting minutes from their formal approval of the Water Capital Improvement Plan.

An equipment replacement fund was developed as part of the user fee rate analysis. The replacement money reserved annually is calculated using the replacement cost divided by the life of the equipment. The rehab money reserved annually is calculated using the rehab cost divided by the years between rehabilitations. The current reserve funds are sufficient to make up the difference between life of the equipment and years remaining. The anticipated annual replacement and rehabilitation expenditures have a two percent cost of living added in for each year.

Summary

Our Asset Management Program outlines how we will achieve our Asset Management Plan goals. It may be adjusted from time to time based as new/improved tools, software, and evaluation techniques are developed. Regardless of those changes, we will incorporate Asset Management into our everyday activities, including implementation of system improvements and our system master planning. The current level of completion of these goals can be found in the Water Reliability Study. By proactively managing our water system, we will be able to achieve our Desired Level of Service for the lowest possible long term cost.

Appendix D- 2015 City of Bronson Capital Improvement Plan

City of Bronson

Water System CIP Plan

Year	Description	Ouantity	Unit	Unit Price	Construction Total 2015 Dollars	Eng, Adm, Legal 20%	Contingencies 10%	Project Total 2015 Dollars	Project Total Future Dollars	Likely Funding Source
2022	Abandoning the 4" main in Douglas Street and connecting the services onto the parallel 10" main. Replacing the 4" main with 8" main in State Street from Douglas to Walker and replacing the 4" main in Walker Street with 8" main from Union to Railroad	1	LS	102,000.00	\$102,000.00	20,400.00	10,200.00	\$132,600.00	\$186,581.52	General Water Fund
2022	Connecting Grant Street with Douglas and Ruggles with a 10" water main	850	LF	100.00	\$85,000.00	17,000.00	8,500.00	\$110,500.00	\$155,484.60	General Water Fund
2024	Replace the 4" main with 8" main in Douglas Street from Compton to the south end.	425	LF	90.00	\$38,250.00	7,650.00	3,825.00	\$49,725.00	\$77,139.80	
2024	Completing the 8" water main in State Street from Walker to Matteson	300	LF	90.00	\$27,000.00	5,400.00	2,700.00	\$35,100.00	\$54,451.62	
					\$65,250.00	\$13,050.00	\$6,525.00	\$84,825.00	\$131,591.42	General Water Fund
2025	Extending Raymond Street west to Washington (350 LF)	350	LF	90.00	\$31,500.00	6,300.00	3,150.00	\$40,950.00	\$66,703.23	Development Growth
2025	Connecting the south end of Matteson to the south end of Walker Street (600 LF)	600	LF	90.00	\$54,000.00	10,800.00	5,400.00	\$70,200.00	\$114,348.40	Development Growth
2025	Connecting the west end of Chicago to Union Street by installing water main in Albers Road(1,700 LF plus Bore & Jack)	1,700	LF	90.00	\$153,000.00	30,600.00	15,300.00	\$198,900.00	\$323,987.14	Development Growth
2025	Looping the east end of Industrial Street, south to the existing 14" main (1,500 LF plus Bore & Jack)	1,500	LF	120.00	\$180,000.00	36,000.00	18,000.00	\$234,000.00	\$381,161.34	Development Growth
2025	Looping the south end of Wayne Street with the south end of Walnut Street (1,200 LF)	1,200	LF	90.00	\$108,000.00	21,600.00	10,800.00	\$140,400.00	\$228,696.81	Development Growth
2032	Replace the 4" main in Corey Street with 8" main From Walker Street to Wayne Street.	3,150	LF	90.00	\$283,500.00	56,700.00	28,350.00	\$368,550.00	\$844,723.35	
2032	Replace the 4" main in Mowry Avenue / Shaffmaster from Compton to Union	2,200	LF	90.00	\$198,000.00	39,600.00	19,800.00	\$257,400.00	\$589,965.52	
2032	Replace the 4" main in South Street from Division to Ruggles	900	LF	90.00	\$81,000.00	16,200.00	8,100.00	\$105,300.00	\$241,349.53	
2032	Replace the 4" main in Douglas from Compton to Union	1,850	LF	90.00	\$166,500.00	33,300.00	16,650.00	\$216,450.00	\$496,107.36	
2032	Replace the 4" main in Franklin Street from Ruggles to Douglas	350	LF	90.00	\$31,500.00	6,300.00	3,150.00	\$40,950.00	\$93,858.15	
2032	Replace the 4" main in Walker from York to Union	700	LF	90.00	\$63,000.00	12,600.00	6,300.00	\$81,900.00	\$187,716.30	
2032	Replace the 4" main in Water Main located between Chicago and Corey and between Matteson to Cynthia	700	LF	90.00	\$63,000.00	12,600.00	6,300.00	\$81,900.00	\$187,716.30	
2032	Replace the 4" main in Buchanan Street from Chicago to Railroad Street	1,800	LF	90.00	\$162,000.00	32,400.00	16,200.00	\$210,600.00	\$482,699.06	
2032	Replace the 4" main in Winona Street from Chicago to Railroad Street	1,700	LF	90.00	\$153,000.00	30,600.00	15,300.00	\$198,900.00	\$455,882.44	
2032	Replace the 4" main in Washington Street from Chicago to Railroad Street	1,650	LF	90.00	\$148,500.00	29,700.00	14,850.00	\$193,050.00	\$442,474.14	
2032	Replace the 4" main in Lincoln Street from Chicago to Filmore Street	1,300	LF	90.00	\$117,000.00	23,400.00	11,700.00	\$152,100.00	\$348,615.99	
2032	Replace the 4" main in Filmore Street from Washington To Sherman	650	LF	90.00	\$58,500.00	11,700.00	5,850.00	\$76,050.00	\$174,307.99	
					\$1,242,000.00	\$248,400.00	\$124,200.00	\$1,614,600.00	\$3,700,692.78	DWRF

Future dollars assumes a 5% increase per year until project occurs

This CIP will be expanded when the Asset Management plan is generated in 2018

2150690

	Opinion of
Short Term Improvement Project	Probable
	Project Cost
1. Install a permanent generator at Well No. 4.	\$30,000
2. Have both wells and pumps serviced and overhauled to bring them back to design capacity of 750 gpm each.	\$50,000
3. Perform the maintenance and painting as outlined in the Nelson Report for the elevated storage tank.	\$70,000
4. Abandoning the 4" main in Douglas Street and connecting the services onto the parallel 10" main. Replacing the 4" main with 8" main in State Street from Douglas to Walker and replacing the 4" main in Walker Street with 8" main from Union to Railroad Street.	\$127,500
5. Replace the 4" main with 8" main in Douglas Street from Compton to the south end. (425 LF)	\$42,500
6. Replace the 4" main in Corey Street with 8" main From Walker Street to Wayne Street. (3,150 LF)	\$315,000
7. Replace the 4" main in Matteson Street from Grant Street to Park Street and replace the 4" main in Rudd Street from Walker to	
Matteson. (1,025 LF)	\$102,500 * Completed in 2016
Total	\$737,500

Notes:

- 1. Opinion of Cost includes 25 percent allowance for legal and administrative costs, engineering and contingencies.
- 2. The Opinion of Cost is based on 2011 dollars
- 3. Does not include water service replacements or extensive restoration.

	Opinion of
Long Term Improvement Project	Probable
(4-inch water main replacement)	Project Cost
1. Mowry Avenue / Shaffmaster from Compton to Union (2,200 LF plus Bore & Jack)	\$245,000
2. South Street from Division to Ruggles (900 LF)	\$90,000
3. Douglas from Compton to Union (1,850 LF plus Bore & Jack)	\$210,000
4. Franklin Street from Ruggles to Douglas (350 LF)	\$35,000
5. Walker from York to Union (700 LF)	\$70,000
6. Water Main located between Chicago and Corey and between Matteson to Cynthia (700 LF)	\$70,000
7. Buchanan Street from Chicago to Railroad Street (1,800 LF)	\$180,000
8. Winona Street from Chicago to Railroad Street (1,700 LF)	\$170,000
9. Washington Street from Chicago to Railroad Street (1,650 LF)	\$165,000
10. Lincoln Street from Chicago to Filmore Street(1,300 LF)	\$130,000
11. Filmore Street from Washington To Sherman (650 LF)	\$65,000
Total	\$1,430,000

Notes:

- 1. Opinion of Cost includes 25 percent allowance for legal and administrative costs, engineering and contingencies.
- 2. The Opinion of Cost is based on 2011 dollars
- 3. Does not include water service replacements or extensive restoration.

	Opinion of
"Loops" Improvement Project	Probable
	Project Cost
1. Connecting Grant Street with Douglas and Ruggles with a 10" water main (850 LF)	\$85,000.00
2. Extending Raymond Street west to Washington (350 LF)	\$35,000.00
3. Completing the 8" water main in State Street from Walker to Matteson (300 LF)	\$30,000.00
4. Connecting the south end of Matteson to the south end of Walker Street (600 LF)	\$60,000.00
5. Connecting the west end of Chicago to Union Street by installing water main in Albers	
Road(1,700 LF plus Bore & Jack)	\$200,000.00
6 Looping the east end of Industrial Street south to the existing 14" main (1 500 LF plus	
Bore & Jack)	\$175,000.00
7. Looping the south end of Wayne Street with the south end of Walnut Street (1,200 LF)	\$120,000.00
Total	\$705,000.00

Notes:

Opinion of Cost includes 25 percent allowance for legal and administrative costs, engineering and contingencies. The Opinion of Cost is based on 2011 dollars 1.

2.

Does not include water service replacements or extensive restoration. 3.

Appendix C

2022 Updates to Capital Improvement Plan (excerpts)

Prein&Newhof



CITY OF BRONSON CAPITAL IMPROVEMENT PLAN WATER PROJECTS Prein&Newhof 2130268

Appendix D

Zoning Map

Prein&Newhof



Appendix E

Project Cost Estimates and User Cost Estimates

Project and User Cost Estimate

Project Description	Number	Total Cost	Notes
Water Main Replacements and Loops	1-15	\$ 11,639,600	FY24
Lead Service Line Replacements	16	\$ 13,271,400	FY24
		\$ 24,911,000	
Loan Term	40		
Loan Interest Rate	1.875%	<u>.</u>	
Annual Debt Payment	\$ 890,796		
Annual Cost per REU	\$ 812.40		
Monthly Cost per REU	\$ 67.70		
Current Population:	2345		
Residential Services (REU):	915	2022 Annual Water Use:	43.7 MG
Com/Ind Services (REU):	181.5	2022 Annual Water Use:	2.014 MG
		1	
Total REU's:	1096.5		

City uses AWWA meter Equivalents to determine REUs

Water usage comes from City billings

Owner:	
City of Bronson	
Project Title:	
PROJECT #01: Mowry Avenue / Shaffmaster (Rudd to Un	nion) - Replacement
Date:	Project #:
March 2023	2220862

ltem No	Description	Quantity	Unit	Unit Price	Total Amount	
110.	Description	Quantity	Onit	Unit i fiec	Totat / into and	
1	General Conditions / Mobilization (10%)	1	LS	\$86,700.00	\$86,700.00	
2	Abandon watermain	2,700	LF	\$7.00	\$18,900.00	
3	8" Watermain	2,700	LF	\$90.00	\$243,000.00	
4	12" Watermain	0	LF	\$100.00	\$0.00	
5	Bore & Jack	80	LF	\$400.00	\$32,000.00	
6	Connect to existing WM	11	EA	\$3,000.00	\$33,000.00	
7	Watermain Valve	20	EA	\$2,200.00	\$44,000.00	
8	Remove pavement	350	SY	\$5.00	\$1,750.00	
9	Remove and replace driveways	16	EA	\$1,500.00	\$24,000.00	
10	Remove and Replace Concrete Sidewalk	13,500	SF	\$8.00	\$108,000.00	
11	Remove and Replace Curb	300	LF	\$30.00	\$9,000.00	
12	Hydrant Complete	8	EA	\$6,000.00	\$48,000.00	
13	Water Services	42	EA	\$5,500.00	\$231,000.00	
14	HMA road patch - Complete	350	SY	\$60.00	\$21,000.00	
15	Restoration	1	LS	\$27,000.00	\$27,000.00	
16	Traffic Control	1	LS	\$25,000.00	\$25,000.00	
17	Soil Erosion Control	1	LS	\$1,500.00	\$1,500.00	
	Subtotal				\$953,850.00	
	Contingencies (10%)				\$95,385.00	
	Engineering, Administration & Legal (25%)				\$238,462.50	
	Project Total \$1,287,697.50					

Owner:		
City of Bronson		
Project Title:		
PROJECT #02: South Street (Division to Ruggles) - Replacem	ent	
Date:	Project #:	
March 2023	2220862	

ltem		_			T (1 A)
No.	Description	Quantity	Unit	Unit Price	Iotal Amount
1	General Conditions / Mobilization (10%)	1	LS	\$26,200.00	\$26,200.00
2	Abandon watermain	900	LF	\$7.00	\$6,300.00
3	8" Watermain	900	LF	\$90.00	\$81,000.00
4	12" Watermain	0	LF	\$100.00	\$0.00
5	Connect to existing WM	4	EA	\$3,000.00	\$12,000.00
6	Watermain Valve	4	EA	\$2,200.00	\$8,800.00
7	Remove pavement	150	SY	\$5.00	\$750.00
8	Remove and replace driveways	4	EA	\$1,500.00	\$6,000.00
9	Remove and Replace Concrete Sidewalk	4,500	SF	\$8.00	\$36,000.00
10	Remove and Replace Curb	120	LF	\$30.00	\$3,600.00
11	Hydrant Complete	2	EA	\$6,000.00	\$12,000.00
12	Water Services	13	EA	\$5,500.00	\$71,500.00
13	HMA road patch - Complete	150	SY	\$60.00	\$9,000.00
14	Restoration	1	LS	\$9,000.00	\$9,000.00
15	Traffic Control	1	LS	\$5,000.00	\$5,000.00
16	Soil Erosion Control	1	LS	\$1,000.00	\$1,000.00
	Subtotal				\$288,150.00
	Contingencies (10%)				\$28,815.00
	Engineering, Administration & Legal (25%)				\$72,037.50
	Project Total				\$389,002.50

Owner:				
City of Bronson				
Project Title:				
PROJECT #03: Douglas (Grant to Union) - Replacement				
Date:	Project #:			
March 2023	2220862			

ltem No	Description	Quantity	Unit	Unit Price	Total Amount
1101	Description	Quantity	Onit		
1	General Conditions / Mobilization (10%)	1	LS	\$79,000.00	\$79,000.00
2	Abandon watermain	2,250	LF	\$7.00	\$15,750.00
3	8" Watermain	2,250	LF	\$90.00	\$202,500.00
4	12" Watermain	0	LF	\$100.00	\$0.00
5	Bore & Jack	80	LF	\$400.00	\$32,000.00
6	Connect to existing WM	8	EA	\$3,000.00	\$24,000.00
7	Watermain Valve	12	EA	\$2,200.00	\$26,400.00
8	Remove pavement	270	SY	\$5.00	\$1,350.00
9	Remove and replace driveways	18	EA	\$1,500.00	\$27,000.00
10	Remove and Replace Concrete Sidewalk	11,250	SF	\$8.00	\$90,000.00
11	Remove and Replace Curb	360	LF	\$30.00	\$10,800.00
12	Hydrant Complete	6	EA	\$6,000.00	\$36,000.00
13	Water Services	47	EA	\$5,500.00	\$258,500.00
14	HMA road patch - Complete	270	SY	\$60.00	\$16,200.00
15	Restoration	1	LS	\$22,500.00	\$22,500.00
16	Traffic Control	1	LS	\$25,000.00	\$25,000.00
17	Soil Erosion Control	1	LS	\$1,500.00	\$1,500.00
	Subtotal				\$868,500.00
	Contingencies (10%)				\$86,850.00
	Engineering, Administration & Legal (25%)				\$217,125.00
	Project Total				\$1,172,475.00

Owner:	
City of Bronson	
Project Title:	
PROJECT #04: Franklin Street (Ruggles to Douglas)) - Replacement
Date:	Project #:
March 2023	2220862

ltem					
No.	Description	Quantity	Unit	Unit Price	Total Amount
1	General Conditions / Mobilization (10%)	1	LS	\$12,300.00	\$12,300.00
2	Abandon watermain	350	LF	\$7.00	\$2,450.00
3	8" Watermain	350	LF	\$90.00	\$31,500.00
4	12" Watermain	0	LF	\$100.00	\$0.00
5	Connect to existing WM	2	EA	\$3,000.00	\$6,000.00
6	Watermain Valve	2	EA	\$2,200.00	\$4,400.00
7	Remove pavement	120	SY	\$5.00	\$600.00
8	Remove and replace driveways	3	EA	\$1,500.00	\$4,500.00
9	Remove and Replace Concrete Sidewalk	1,750	SF	\$8.00	\$14,000.00
10	Remove and Replace Curb	120	LF	\$30.00	\$3,600.00
11	Hydrant Complete	2	EA	\$6,000.00	\$12,000.00
12	Water Services	5	EA	\$5,500.00	\$27,500.00
13	HMA road patch - Complete	120	SY	\$60.00	\$7,200.00
14	Restoration	1	LS	\$3,500.00	\$3,500.00
15	Traffic Control	1	LS	\$5,000.00	\$5,000.00
16	Soil Erosion Control	1	LS	\$1,000.00	\$1,000.00
	Subtotal				\$135,550.00
	Contingencies (10%)				\$13,555.00
	Engineering, Administration & Legal (25%)				\$33,887.50
	Project Total				\$182,992.50

Owner:				
City of Bronson				
Project Title:				
PROJECT #05: Walker (York to Railroad) - Replacement				
Date:	Project #:			
March 2023	2220862			

ltem					
No.	Description	Quantity	Unit	Unit Price	Total Amount
1	General Conditions / Mobilization (10%)	1	LS	\$45,900.00	\$45,900.00
2	Abandon watermain	1,400	LF	\$7.00	\$9,800.00
3	8" Watermain	1,400	LF	\$90.00	\$126,000.00
4	12" Watermain	0	LF	\$100.00	\$0.00
5	Connect to existing WM	7	EA	\$3,000.00	\$21,000.00
6	Watermain Valve	9	EA	\$2,200.00	\$19,800.00
7	Remove pavement	280	SY	\$5.00	\$1,400.00
8	Remove and replace driveways	8	EA	\$1,500.00	\$12,000.00
9	Remove and Replace Concrete Sidewalk	7,000	SF	\$8.00	\$56,000.00
10	Remove and Replace Curb	300	LF	\$30.00	\$9,000.00
11	Hydrant Complete	4	EA	\$6,000.00	\$24,000.00
12	Water Services	26	EA	\$5,500.00	\$143,000.00
13	HMA road patch - Complete	280	SY	\$60.00	\$16,800.00
14	Restoration	1	LS	\$14,000.00	\$14,000.00
15	Traffic Control	1	LS	\$5,000.00	\$5,000.00
16	Soil Erosion Control	1	LS	\$1,000.00	\$1,000.00
	Subtotal				\$504,700.00
	Contingencies (10%) \$50,470.0				
	Engineering, Administration & Legal (25%)				\$126,175.00
	Project Total				\$681,345.00

Owner:	
City of Bronson	
Project Title:	
PROJECT #06: State Street (Douglas to Matteson) - R	eplacement / Loop
Date:	Project #:
March 2023	2220862

ltem					
No.	Description	Quantity	Unit	Unit Price	Iotal Amount
1	General Conditions / Mobilization (10%)	1	LS	\$32,100.00	\$32,100.00
2	Abandon watermain	852	LF	\$7.00	\$5,964.00
3	8" Watermain	1,000	LF	\$90.00	\$90,000.00
4	12" Watermain	0	LF	\$100.00	\$0.00
5	Connect to existing WM	6	EA	\$3,000.00	\$18,000.00
6	Watermain Valve	8	EA	\$2,200.00	\$17,600.00
7	Remove pavement	150	SY	\$5.00	\$750.00
8	Remove and replace driveways	6	EA	\$1,500.00	\$9,000.00
9	Remove and Replace Concrete Sidewalk	5,500	SF	\$8.00	\$44,000.00
10	Remove and Replace Curb	100	LF	\$30.00	\$3,000.00
11	Hydrant Complete	2	EA	\$6,000.00	\$12,000.00
12	Water Services	18	EA	\$5,500.00	\$99,000.00
13	HMA road patch - Complete	150	SY	\$60.00	\$9,000.00
14	Restoration	1	LS	\$10,000.00	\$10,000.00
15	Traffic Control	1	LS	\$2,000.00	\$2,000.00
16	Soil Erosion Control	1	LS	\$500.00	\$500.00
	Subtotal				\$352,914.00
	Contingencies (10%)				\$35,291.40
	Engineering, Administration & Legal (25%)				\$88,228.50
	Project Total				\$476,433.90

Owner:	
City of Bronson	
Project Title:	
PROJECT #07: N Douglas & W Railroad (Union to 1	Matteson) - Replacement
Date:	Project #:
March 2023	2220862

ltem					T , 14 ,
No.	Description	Quantity	Unit	Unit Price	Total Amount
_		_			
1	General Conditions / Mobilization (10%)	1	LS	\$35,300.00	\$35,300.00
2	Abandon watermain	1,490	LF	\$7.00	\$10,430.00
3	8" Watermain	1,000	LF	\$90.00	\$90,000.00
4	12" Watermain	0	LF	\$100.00	\$0.00
5	Connect to existing WM	3	EA	\$3,000.00	\$9,000.00
6	Watermain Valve	4	EA	\$2,200.00	\$8,800.00
7	Remove pavement	1,600	SY	\$5.00	\$8,000.00
8	Remove and replace driveways	3	EA	\$1,500.00	\$4,500.00
9	Remove and Replace Concrete Sidewalk	5,700	SF	\$8.00	\$45,600.00
10	Remove and Replace Curb	75	LF	\$30.00	\$2,250.00
11	Hydrant Complete	3	EA	\$6,000.00	\$18,000.00
12	Water Services	8	EA	\$5,500.00	\$44,000.00
13	HMA road patch - Complete	1,600	SY	\$60.00	\$96,000.00
14	Restoration	1	LS	\$10,000.00	\$10,000.00
15	Traffic Control	1	LS	\$5,000.00	\$5,000.00
16	Soil Erosion Control	1	LS	\$1,000.00	\$1,000.00
	Subtotal				\$387,880.00
	Contingencies (10%)				\$38,788.00
	Engineering, Administration & Legal (25%)				\$96,970.00
	Project Total \$523,638.0				\$523,638.00

Owner:	
City of Bronson	
Project Title:	
PROJECT #08: E Railroad Street (Buchanan to V	Winona) - Replacement
Date:	Project #:
March 2023	2220862

ltem					
No.	Description	Quantity	Unit	Unit Price	Total Amount
1	General Conditions / Mobilization (10%)	1	LS	\$10,200.00	\$10,200.00
2	Abandon watermain	400	LF	\$7.00	\$2,800.00
3	10" Watermain	400	LF	\$95.00	\$38,000.00
4	12" Watermain	0	LF	\$100.00	\$0.00
5	Connect to existing WM	2	EA	\$3,000.00	\$6,000.00
6	Watermain Valve	2	EA	\$2,200.00	\$4,400.00
7	Remove pavement	50	SY	\$5.00	\$250.00
8	Remove and replace driveways	3	EA	\$1,500.00	\$4,500.00
9	Remove and Replace Concrete Sidewalk	1,850	SF	\$8.00	\$14,800.00
10	Remove and Replace Curb	40	LF	\$30.00	\$1,200.00
11	Hydrant Complete	1	EA	\$6,000.00	\$6,000.00
12	Water Services	2	EA	\$5,500.00	\$11,000.00
13	HMA road patch - Complete	50	SY	\$60.00	\$3,000.00
14	Restoration	1	LS	\$4,000.00	\$4,000.00
15	Traffic Control	1	LS	\$5,000.00	\$5,000.00
16	Soil Erosion Control	1	LS	\$1,000.00	\$1,000.00
	Subtotal				\$112,150.00
	Contingencies (10%)				\$11,215.00
	Engineering, Administration & Legal (25%)				\$28,037.50
	Project Total				\$151,402.50

Prein&Newhof

Engineers Surveyors Environmental Laboratory

Owner: City of Bronson Project Title: PROJECT #09: Buchanan Street (Chicago to Railroad Street) - Replacement Date: Project #: March 2023 2220862

ltem	Description	Quantity	11	Unit Drico	Total Amount
NO.	Description	Qualitity	Unit	Onit Frice	Total Amount
1	General Conditions / Mobilization (10%)	1	LS	\$55,200.00	\$55,200.00
2	Abandon watermain	1,800	LF	\$7.00	\$12,600.00
3	8" Watermain	1,800	LF	\$90.00	\$162,000.00
4	12" Watermain	0	LF	\$100.00	\$0.00
5	Connect to existing WM	4	EA	\$3,000.00	\$12,000.00
6	Watermain Valve	7	EA	\$2,200.00	\$15,400.00
7	Remove pavement	230	SY	\$5.00	\$1,150.00
8	Remove and replace driveways	16	EA	\$1,500.00	\$24,000.00
9	Remove and Replace Concrete Sidewalk	9,000	SF	\$8.00	\$72,000.00
10	Remove and Replace Curb	140	LF	\$30.00	\$4,200.00
11	Hydrant Complete	4	EA	\$6,000.00	\$24,000.00
12	Water Services	34	EA	\$5,500.00	\$187,000.00
13	HMA road patch - Complete	230	SY	\$60.00	\$13,800.00
14	Restoration	1	LS	\$18,000.00	\$18,000.00
15	Traffic Control	1	LS	\$5,000.00	\$5,000.00
16	Soil Erosion Control	1	LS	\$1,000.00	\$1,000.00
	Subtotal				\$607,350.00
	Contingencies (10%)				\$60,735.00
	Engineering, Administration & Legal (25%)				\$151,837.50
	Project Total				\$819,922.50

Owner:	
City of Bronson	
Project Title:	
PROJECT #10: Winona Street (Chicago to Railroa	ad Street) - Replacement
Date:	Project #:
March 2023	2220862

ltem					
No.	Description	Quantity	Unit	Unit Price	Total Amount
1	General Conditions / Mobilization (10%)	1	LS	\$56,200.00	\$56,200.00
2	Abandon watermain	1,700	LF	\$7.00	\$11,900.00
3	8" Watermain	1,700	LF	\$90.00	\$153,000.00
4	12" Watermain	0	LF	\$100.00	\$0.00
5	Connect to existing WM	6	EA	\$3,000.00	\$18,000.00
6	Watermain Valve	8	EA	\$2,200.00	\$17,600.00
7	Remove pavement	230	SY	\$5.00	\$1,150.00
8	Remove and replace driveways	16	EA	\$1,500.00	\$24,000.00
9	Remove and Replace Concrete Sidewalk	8,500	SF	\$8.00	\$68,000.00
10	Remove and Replace Curb	140	LF	\$30.00	\$4,200.00
11	Hydrant Complete	4	EA	\$6,000.00	\$24,000.00
12	Water Services	37	EA	\$5,500.00	\$203,500.00
13	HMA road patch - Complete	230	SY	\$60.00	\$13,800.00
14	Restoration	1	LS	\$17,000.00	\$17,000.00
15	Traffic Control	1	LS	\$5,000.00	\$5,000.00
16	Soil Erosion Control	1	LS	\$1,000.00	\$1,000.00
	Subtotal				\$618,350.00
	Contingencies (10%)				\$61,835.00
	Engineering, Administration & Legal (25%)				\$154,587.50
	Project Total				\$834,772.50

Owner:	
City of Bronson	
Project Title:	
PROJECT #11: Washington Street (Chicago to R	ailroad Street) - Replacement
Date:	Project #:
March 2023	2220862

ltem					
No.	Description	Quantity	Unit	Unit Price	Total Amount
1	General Conditions / Mobilization (10%)	1	LS	\$51,000.00	\$51,000.00
2	Abandon watermain	1,670	LF	\$7.00	\$11,690.00
3	8" Watermain	1,670	LF	\$90.00	\$150,300.00
4	12" Watermain	0	LF	\$100.00	\$0.00
5	Connect to existing WM	6	EA	\$3,000.00	\$18,000.00
6	Watermain Valve	10	EA	\$2,200.00	\$22,000.00
7	Remove pavement	230	SY	\$5.00	\$1,150.00
8	Remove and replace driveways	14	EA	\$1,500.00	\$21,000.00
9	Remove and Replace Concrete Sidewalk	8,350	SF	\$8.00	\$66,800.00
10	Remove and Replace Curb	140	LF	\$30.00	\$4,200.00
11	Hydrant Complete	4	EA	\$6,000.00	\$24,000.00
12	Water Services	28	EA	\$5,500.00	\$154,000.00
13	HMA road patch - Complete	230	SY	\$60.00	\$13,800.00
14	Restoration	1	LS	\$16,700.00	\$16,700.00
15	Traffic Control	1	LS	\$5,000.00	\$5,000.00
16	Soil Erosion Control	1	LS	\$1,000.00	\$1,000.00
	Subtotal				\$560,640.00
	Contingencies (10%)				\$56,064.00
	Engineering, Administration & Legal (25%)				\$140,160.00
	Project Total				\$756,864.00

Owner:	
City of Bronson	
Project Title:	
PROJECT #12: Lincoln Street (Chicago to Filmo	ore Street) - Replacement
Date:	Project #:
March 2023	2220862

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NO.	Description	Quantity	Unit	Unit Price	Total Amount
1	General Conditions / Mobilization (10%)	1	LS	\$37,000.00	\$37,000.00
2	Abandon watermain	1,220	LF	\$7.00	\$8,540.00
3	8" Watermain	1,220	LF	\$90.00	\$109,800.00
4	12" Watermain	0	LF	\$100.00	\$0.00
5	Connect to existing WM	4	EA	\$3,000.00	\$12,000.00
6	Watermain Valve	6	EA	\$2,200.00	\$13,200.00
7	Remove pavement	150	SY	\$5.00	\$750.00
8	Remove and replace driveways	9	EA	\$1,500.00	\$13,500.00
9	Remove and Replace Concrete Sidewalk	6,100	SF	\$8.00	\$48,800.00
10	Remove and Replace Curb	100	LF	\$30.00	\$3,000.00
11	Hydrant Complete	3	EA	\$6,000.00	\$18,000.00
12	Water Services	21	EA	\$5,500.00	\$115,500.00
13	HMA road patch - Complete	150	SY	\$60.00	\$9,000.00
14	Restoration	1	LS	\$12,200.00	\$12,200.00
15	Traffic Control	1	LS	\$5,000.00	\$5,000.00
16	Soil Erosion Control	1	LS	\$1,000.00	\$1,000.00
	Subtotal				\$407,290.00
	Contingencies (10%)				\$40,729.00
	Engineering, Administration & Legal (25%)				\$101,822.50
	Project Total				\$549,841.50

Owner:	
City of Bronson	
Project Title:	
PROJECT #13: Filmore Street (Washington to Sherma	n St) - Replacement
Date:	Project #:
March 2023	2220862

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No.	Description	Quantity	Unit	Unit Price	Total Amount
1	General Conditions (Mabilization (10%)	1	TC	\$10,000,00	¢10.000.00
1	General Conditions / Moomzation (10%)	1	LS	\$19,900.00	\$19,900.00
2	Abandon watermain	600	LF	\$7.00	\$4,200.00
3	8" Watermain	600	LF	\$90.00	\$54,000.00
4	12" Watermain	0	LF	\$100.00	\$0.00
5	Connect to existing WM	4	EA	\$3,000.00	\$12,000.00
6	Watermain Valve	6	EA	\$2,200.00	\$13,200.00
7	Remove pavement	140	SY	\$5.00	\$700.00
8	Remove and replace driveways	4	EA	\$1,500.00	\$6,000.00
9	Remove and Replace Concrete Sidewalk	3,000	SF	\$8.00	\$24,000.00
10	Remove and Replace Curb	100	LF	\$30.00	\$3,000.00
11	Hydrant Complete	2	EA	\$6,000.00	\$12,000.00
12	Water Services	9	EA	\$5,500.00	\$49,500.00
13	HMA road patch - Complete	140	SY	\$60.00	\$8,400.00
14	Restoration	1	LS	\$6,000.00	\$6,000.00
15	Traffic Control	1	LS	\$5,000.00	\$5,000.00
16	Soil Erosion Control	1	LS	\$1,000.00	\$1,000.00
	Subtotal				\$218,900.00
	Contingencies (10%)				\$21,890.00
	Engineering, Administration & Legal (25%)				\$54,725.00
	Project Total				\$295,515.00

Owner:	
City of Bronson	
Project Title:	
PROJECT #14: Corey Street (Matteson Street to	o Wayne Street) - Replacement / Loop
Date:	Project #:
March 2023	2220862

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No.	Description	Quantity	Unit	Unit Price	Total Amount
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1	General Conditions / Mobilization (10%)	1	LS	\$80,300.00	\$80,300.00
2	Abandon watermain	2,200	LF	\$7.00	\$15,400.00
3	8" Watermain	2,200	LF	\$90.00	\$198,000.00
4	12" Watermain	500	LF	\$100.00	\$50,000.00
5	Connect to existing WM	7	EA	\$3,000.00	\$21,000.00
6	Watermain Valve	12	EA	\$2,200.00	\$26,400.00
7	Remove pavement	450	SY	\$5.00	\$2,250.00
8	Remove and replace driveways	20	EA	\$1,500.00	\$30,000.00
9	Remove and Replace Concrete Sidewalk	13,500	SF	\$8.00	\$108,000.00
10	Remove and Replace Curb	250	LF	\$30.00	\$7,500.00
11	Hydrant Complete	7	EA	\$6,000.00	\$42,000.00
12	Water Services	44	EA	\$5,500.00	\$242,000.00
13	HMA road patch - Complete	450	SY	\$60.00	\$27,000.00
14	Restoration	1	LS	\$27,000.00	\$27,000.00
15	Traffic Control	1	LS	\$5,000.00	\$5,000.00
16	Soil Erosion Control	1	LS	\$1,000.00	\$1,000.00
	Subtotal				\$882,850.00
	Contingencies (10%)				\$88,285.00
	Engineering, Administration & Legal (25%)				\$220,712.50
	Project Total				\$1,191,847.50

Owner:					
City of Bronson					
Project Title:					
PROJECT #15: Chicago and Corey and between Matteson to Cynthia - Replacement					
Date:	Project #:				
March 2023	2220862				

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NO.	Description	Quantity	Unit	Unit Price	Total Amount	
1	General Conditions / Mobilization (10%)	1	LS	\$17,600.00	\$17,600.00	
2	Abandon watermain	740	LF	\$7.00	\$5,180.00	
3	8" Watermain	740	LF	\$85.00	\$62,900.00	
4	12" Watermain	0	LF	\$100.00	\$0.00	
5	Connect to existing WM	2	EA	\$3,000.00	\$6,000.00	
6	Watermain Valve	2	EA	\$2,200.00	\$4,400.00	
7	Remove pavement	1,350	SY	\$10.00	\$13,500.00	
8	Remove and replace driveways	0	EA	\$1,500.00	\$0.00	
9	Remove and Replace Concrete Sidewalk	200	SF	\$8.00	\$1,600.00	
10	Remove and Replace Curb	40	LF	\$50.00	\$2,000.00	
11	Hydrant Complete	2	EA	\$5,000.00	\$10,000.00	
12	Water Services	2	EA	\$5,500.00	\$11,000.00	
13	HMA road patch - Complete	1,350	SY	\$40.00	\$54,000.00	
14	Restoration	1	LS	\$3,700.00	\$3,700.00	
15	Traffic Control	1	LS	\$1,480.00	\$1,480.00	
16	Soil Erosion Control	1	LS	\$370.00	\$370.00	
	Subtotal				\$193,730.00	
	Contingencies (10%) \$19,373.0					
	Engineering, Administration & Legal (25%) \$48,432.5					
	Project Total \$261,535.5					
Prein&Newhof Engineers • Surveyors • Environmental • Laboratory

Owner:	
City of Bronson	
Project Title:	
PROJECT #16: Lead Service Replacement - City wide	
Date:	Project #:
March 2023	2220862

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NO.	Description	Quantity	Unit	Unit Price	Total Amount
1	Mobilization	1	LS	\$82,900.00	\$82,900.00
2	Water Service Potholing	829	EA	\$600.00	\$497,400.00
3	Water Service - Long Side, 3/4 inch	415	EA	\$2,400.00	\$994,800.00
4	Water Service - Short Side, 3/4 inch	415	EA	\$2,000.00	\$829,000.00
5	Water Service - Yard (Private), 3/4 inch	809	EA	\$4,000.00	\$3,236,000.00
6	Water Service, 1"	6	EA	\$8,000.00	\$48,000.00
7	Water Service, 1.5"	10	EA	\$10,000.00	\$100,000.00
8	Water Service, 2"	4	EA	\$15,000.00	\$60,000.00
9	House Connection w/Plummer	829	EA	\$400.00	\$331,600.00
10	Abandon Blind	17	EA	\$600.00	\$9,948.00
11	Sidewalk Remove and Replace	39,792	SF	\$15.00	\$596,880.00
12	Curb Remove and Replace	7,958	LF	\$50.00	\$397,920.00
13	Road Remove and Replace	10,611	SY	\$100.00	\$1,061,120.00
14	HMA Driveway Remove and Replace	1,409	SY	\$80.00	\$112,744.00
15	Concrete Driveway Remove and Replace	1,409	SY	\$120.00	\$169,116.00
16	Traffic Control	1	LS	\$207,250.00	\$207,250.00
	Subtotal				\$8,734,678.00
	Contingencies (10%)				\$873,467.80
	Engineering, Administration & Legal (15%)				\$1,310,201.70
	Project Total				\$10,918,347.50

All work quantities and costs are estimated for preliminary planning purposes only. Costs estimated in 2022 Dollars

Appendix F

State Historic Preservation Office, Tribal Historic Preservation Officers

Prein&Newhof

This Scope of Services dated January 23, 2023 pertains to an agreement between Orbis Environmental Consulting (Orbis) and Prein&Newhof (P&N) cultural resource services for a proposed water system improvement project in Bronson, MI (Orbis #2301007).

The project will replace existing infrastructure for water and wastewater in the City of Bronson (as shown in a January 19 email).

The water system improvements include areas of aging and undersized water main within the utility Right-of-Way (ROW). In addition, it will include replacement of lead service lines both inside and outside the ROW. These service lines will be constructed to individual structures in the same location as the existing service lines and will not require excavating trenches. No new easements will be required as part of the water projects.

Work proposed on the wastewater system is extensive and can be separated into the work on the treatment plant and the collection system.

The wastewater treatment plant will be improved with construction of a new headworks building within a city owned property to the west of the existing plant. Other improvements at the treatment plant are within the footprint of the existing structures and are related to replacing or upgrading existing equipment.

The wastewater collection system will be repaired at many locations, primarily using either a cured-in-place lining system or a chemical grout to systematically repair the existing system. The four locations that require open cutting to repair the existing sanitary are currently under the existing road surface. Two other locations of sewer repairs involve open cutting the roadway surface for the disconnection of the storm sewers from the sanitary system. This work will be entirely in the existing ROW on the existing system. In addition, two lift stations will be replaced and relocated near their current locations. The new locations are in previously disturbed areas near the road (i.e. lawns), and will be placed under new easements.

The water system project is applying for a State Revolving Fund (SRF) grant from the Michigan Department of Environment, Great Lakes, and Energy (EGLE) and the wastewater system project is applying for a Rural Development (RD) grant from the U.S. Department of Agriculture (USDA). Each of these processes require review and consultation with the Michigan State Historic Preservation Office (MSHPO) under Section 106 of the National Historic Preservation Act (NHPA).

The purpose of this consultation is to examine the areas for the presence or absence of known cultural resources and provide this information to P&N for an Application for Section 106 Review.



Orbis cultural resources staff include an archaeologist and architectural historian who meet the applicable federal qualifications outlined in 36 CFR Part 61. Our senior staff have completed numerous similar projects involving Applications for Section 106 Review.

OBJECTIVES

The goals and objectives for the services offered in this proposal include:

- Determine the presence or absence of sensitive documented archaeological and/or historic resources and in or near the project area.
- * To help determine the risk of impacting any sensitive resources and provide recommendations for minimizing this risk.
- Provide information necessary for P&N, the City of Bronson, and other project stakeholders to consult according to regulations as applicable.
- Coordinate with P&N to complete the Application for Section 106 consultation for submittal to the Michigan State Historic Preservation Office (MSHPO).

METRICS

Our measures of success include:

- Concurrence with the results of the investigations by regulatory agencies if reports are submitted to them.
- * Completion of the project within the agreed upon schedule.
- * Positive feedback from P&N and other stakeholders.

VALUE

The value that will accrue from meeting the objectives includes:

- Information on the potential risks associated with sensitive resources that may be impacted by the project.
- Providing assurance to P&N and other project stakeholders that any effects to documented significant resources will be accounted for according to regulatory requirements and professional standards.
- Reduced overall project cost and reduced risk of delays resulting from potential project impacts to known resources when activities take place.
- * Completion of the project within a timeframe that meets project needs.



SCOPE/METHODOLOGY

The Scope of Services include

* Cultural Resources Desktop Review/Application for Section 106 Review

A - Cultural Resource Desktop Review

Orbis will examine available information about previously recorded cultural resources relevant to the project area. Orbis will review information available at the MSHPO as well as other sources of county and township history.

The research will allow Orbis to document significant cultural resources that have been reported in or near the project area and to anticipate the types of unidentified cultural resources that may be present.

The MSHPO office will provide available electronic records. Some records may not be available electronically, but in these cases MSHPO has agreed to provide some general information about these records to support the Application. We have included a travel fee if MSHPO requires in-person research for this project.

Orbis will present the results of the desktop review in a brief report to be included with the Application for Section 106 Review.

We assume one desktop review report will include the results for water and wastewater systems.

Application for Section 106 Review

We will provide the results of the desktop review and any recommendations in the format required by the application. This will include an excel spreadsheet listing historic structures (greater than 50 years of age), a project location map showing known archaeological sites within the Desktop Review area, the results of the desktop review, associated figures, and a recommendation of a finding of effects as appropriate.

We assume that P&N will provide the following information

- Project information for Section I III of the application.
- Project plan/design information.
- Photos of structures 50 years or older along the project corridor and an associated key.

We also assume that P&N will work with the City of Bronson (the applicant/local agency) to coordinate with consulting parties.

P&N is confirming with EGLE and USDA if separate applications will be necessary.



SCHEDULE

Orbis will schedule the Desktop Review following Notice to Proceed and according to agency schedule. The MSHPO has stated that research requests may be delayed due staff and workload, but they have agreed to communicate about any delays and to work with applicants. The recent response time has been up to 4 weeks.

*

Orbis will submit the results of the Desktop Review to P&N within 3-4 weeks of completion of the research. We may revise this schedule in coordination with P&N.

*

JOINT ACCOUNTABILITIES

P&N will provide the project limits, parcels, and other necessary information in an electronic format and provide any updates to this information in a timely manner. Orbis will provide technical services to meet the requirements of the survey and will provide access to key staff and documentation as appropriate.

*

TERMS AND CONDITIONS

The fee in this proposal is valid if an agreement is reached within one year of the date of this proposal. There are no charges for administrative tasks, postage, phone, etc.

Payment for services is due within 30 days of receipt of our invoices, submitted monthly. This project is non-cancelable and agreed-upon payment terms are due as described. However, you may postpone or delay any part of the work in progress without penalty.



FEE

Cultural Resources Desktop Review

Bronson Water System Project - \$1,850

Travel - if MSHPO returns to policy of in-person research - \$600

*

ACCEPTANCE

Your signature below constitutes acceptance of the terms and conditions herein. In lieu of your signature, we will proceed solely based on your payment.

For Orbis Environmental Consulting

For Prein&Newhof

J Ryan Duddleson

Michael Schwartz Thomas C. Wheat

Senior Archaeologist

Date January 25, 2023

Date



Appendix G

Wetland & Floodplain Maps

Prein&Newhof





Appendix H

Protected Species Review

Prein&Newhof

FY2024 CWSRF PROJECT PLAN APPENDIX C IPaC RESULTS EXCERPTS



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



In Reply Refer To: Project Code: 2023-0024307 Project Name: Water and Wastewater Utility Upgrades December 12, 2022

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:

Official Species List

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.

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 IPaC website (<u>https://ipac.ecosphere.fws.gov/</u>) at regular intervals during project planning and implementation. To update an Official Species List in IPaC: from the My Projects page, find the project, expand the row, and click Project Home. In the What's Next box on the Project Home page, there is a Request Updated List button to update your species list. Be sure to select an "official" species list for all projects.

Consultation requirements and next steps

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 two approaches to evaluating the effects of a project on listed species.

<u>Approach 1. Use the All-species Michigan determination key in IPaC.</u> This tool can assist you in making determinations for listed species for some projects. In many cases, the determination key

will provide an automated concurrence that completes all or significant parts of the consultation process. Therefore, we strongly recommend screening your project with the **All-Species Michigan Determination Key (Dkey)**. For additional information on using IPaC and available Determination Keys, visit <u>https://www.fws.gov/media/mifo-ipac-instructions</u> (and click on the attachment). Please carefully review your Dkey output letter to determine whether additional steps are needed to complete the consultation process.

Approach 2. Evaluate the effects to listed species on your own without utilizing a determination key. Once you obtain your official species list, you are not required to continue in IPaC, although in most cases using a determination key should expedite your review. If the project is a Federal action, you should review our section 7 step-by-step instructions before making your determinations: https://www.fws.gov/office/midwest-region-headquarters/midwest-section-7-technical-assistance. If you evaluate the details of your project and conclude "no effect," document your findings, and your listed species review is complete; you do not need our concurrence on "no effect" determinations. If you cannot conclude "no effect," you should coordinate/consult with the Michigan Ecological Services Field Office. The preferred method for submitting your project description and effects determination (if concurrence is needed) is electronically to EastLansing@fws.gov. Please include a copy of this official species list with your request.

For all **wind energy projects** and **projects that include installing communications towers that use guy wires**, 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.

Migratory Birds

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 prohibits the take and disturbance of eagles without a permit. If your project is near an eagle nest or winter roost area, see our Eagle Permits website at https://www.fws.gov/program/eagle-management/eagle-permits 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/partner/council-conservation-migratory-birds.

We appreciate your consideration of threatened and endangered species during your project

Project Summary

Project Code:	2023-0024307
Project Name:	Water and Wastewater Utility Upgrades
Project Type:	Wastewater Pipeline - Maintenance / Modification - Below Ground
Project Description:	Significant rehabilitation of wastewater collection system via trenchless
	pipe lining technology, existing manhole rehab, expansion of treatment
	plant onto existing farmland, relocation of two lift stations into easements
	on private property (lawn). Improvements to drinking water distribution
	system including replacement of existing water main and lead service
	lines.

Project Location:

Approximate location of the project can be viewed in Google Maps: <u>https://</u>www.google.com/maps/@41.87409800000004,-85.18981450141413,14z



Counties: Branch 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 Fisheries¹, 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.

1. <u>NOAA Fisheries</u>, 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. Your location does not overlap the critical habitat.	
Species profile: <u>https://ecos.fws.gov/ecp/species/5949</u>	
General project design guidelines:	
https://ipac.ecosphere.fws.gov/project/VY7VNPBEA5FCZNWD6XHIWLO3CY/	
documents/generated/6982.pdf	
Northern Long-eared Bat Myotis septentrionalis	Endangered
No critical habitat has been designated for this species.	
Species profile: <u>https://ecos.fws.gov/ecp/species/9045</u>	
General project design guidelines:	
https://ipac.ecosphere.fws.gov/project/VY7VNPBEA5FCZNWD6XHIWLO3CY/	
documents/generated/6983.pdf	
Tricolored Bat <i>Perimyotis subflavus</i>	Proposed
No critical habitat has been designated for this species.	Endangered
Species profile: <u>https://ecos.fws.gov/ecp/species/10515</u>	8

Reptiles

NAME	STATUS
Copperbelly Water Snake Nerodia erythrogaster neglecta Population: Indiana north of 40 degrees north latitude, Michigan, Ohio No critical habitat has been designated for this species. Species profile: <u>https://ecos.fws.gov/ecp/species/7253</u>	Threatened
Eastern Massasauga (=rattlesnake) Sistrurus catenatus 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: <u>https://ecos.fws.gov/ecp/species/2202</u> General project design guidelines: <u>https://ipac.ecosphere.fws.gov/project/VY7VNPBEA5FCZNWD6XHIWLO3CY/</u> <u>documents/generated/5280.pdf</u>	Threatened
Insects	STATUS

	01/11/00
Mitchell's Satyr Butterfly Neonympha mitchellii mitchellii	Endangered
No critical habitat has been designated for this species.	
Species profile: <u>https://ecos.fws.gov/ecp/species/8062</u>	
Monarch Butterfly <i>Danaus plexippus</i>	Candidate
No critical habitat has been designated for this species.	

Species profile: https://ecos.fws.gov/ecp/species/9743

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 <u>National Wildlife Refuge</u> 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 Act¹ and the Bald and Golden Eagle Protection Act².

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 <u>below</u>.

- 1. The Migratory Birds Treaty Act of 1918.
- 2. The <u>Bald and Golden Eagle Protection Act</u> 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
Chimney Swift <i>Chaetura pelagica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Rusty Blackbird <i>Euphagus carolinus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Wood Thrush <i>Hylocichla mustelina</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Wetlands

Impacts to <u>NWI wetlands</u> 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>U.S. Army Corps of</u> <u>Engineers District</u>.

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.

THERE ARE NO WETLANDS WITHIN YOUR PROJECT AREA.

Appendix I

Sites of Contamination

Prein&Newhof





BRANCH COUNTY, MICHIGAN DRINKING WATER REVOLVING FUND

CONTAMINATED SITE MAP

MARCH 2023 Prein&Newhof 2220862

LEGEND

- Project Area
- Project Label

(01)

 $\langle \mathbf{B} \rangle$

- Baseline Environmental Assessment
- B Brownfield Site
- Ø Hazardous Waste Site
- ▼ NPDES Site
- ★ Superfund Site
- Toxic Release Site
- Part 201 Environmental Contamination
- Part 211 Underground Storage (Active)
- Part 211 Underground Storage (Closed)
- A Part 213 LUST (Open)
- A Part 213 LUST (Closed)

Impaired Streams

Restrictive Covenant

Sources: The Michigan Department of Environment, Great Lakes, and Energy Environmental Mapper and the U.S. Environmental Protection Agency EnviroMapper for Envirofacts.



Appendix J

Soils Survey Map

Prein&Newhof



United States Department of Agriculture

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

FY2024 DWRF PROJECT PLAN **APPENDIX J**

NRCS SOIL SURVEY EXCERPTS **Custom Soil Resource Report for Branch County,** Michigan

City of Bronson



FY2024 DWRF PROJECT PLAN APPENDIX J NRCS SOIL SURVEY EXCERPTS

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10A—Brady sandy loam, 0 to 2 percent slopes	19
11B—Elmdale fine sandy loam, 2 to 6 percent slopes	20
12A—Teasdale fine sandy loam, 0 to 3 percent slopes	21
15B—Locke fine sandy loam, 1 to 4 percent slopes	22
17—Barry loam, 0 to 2 percent slopes	24
21A—Bronson sandy loam, 0 to 3 percent slopes	26
24—Sebewa loam, 0 to 2 percent slopes	27
25B—Branch loamy sand, 1 to 4 percent slopes	28
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FY2024 DWRF PROJECT PLAN APPENDIX J NRCUSTOR ISON HESSING FREPORTS Soil Map



FY2024 DWRF PROJECT PLAN APPENDIX J NRCS SOIL SURVEY EXCERPTS Custom Soil Resource Report

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI	
4B	Oshtemo sandy loam, 0 to 6 percent slopes	42.3	1.3%	
5B	Hillsdale-Riddles fine sandy loams, 2 to 6 percent slopes	41.2	1.2%	
9A	Matherton sandy loam, 0 to 3 percent slopes	556.5	16.6%	
10A	Brady sandy loam, 0 to 2 percent slopes	5.8	0.2%	
11B	Elmdale fine sandy loam, 2 to 6 percent slopes	31.6	0.9%	
12A	Teasdale fine sandy loam, 0 to 3 percent slopes	41.8	1.2%	
15B	Locke fine sandy loam, 1 to 4 percent slopes	153.2	4.6%	
17	Barry loam, 0 to 2 percent slopes	72.5	2.2%	
21A	Bronson sandy loam, 0 to 3 percent slopes	61.3	1.8%	
24	Sebewa loam, 0 to 2 percent slopes	152.7	4.5%	
25B	Branch loamy sand, 1 to 4 percent slopes	303.2	9.0%	
27A	Fox sandy loam, 0 to 2 percent slopes	231.6	6.9%	
27B	Fox sandy loam, 2 to 6 percent slopes	331.0	9.8%	
33B	Ormas loamy sand, 0 to 6 percent slopes	907.6	27.0%	
38	Udipsamments, gently sloping	11.9	0.4%	
AdraaA	Adrian muck, 0 to 1 percent slopes	67.5	2.0%	
EdwadA	Edwards muck, 0 to 1 percent slopes	135.4	4.0%	
HgtahA	Houghton muck, 0 to 1 percent 210.2 slopes		6.3%	
W	Water	3.3	0.1%	
Totals for Area of Interest		3,360.8	100.0%	

Appendix K

Public Participation Documentation

Appendix L

Resolution Adopting the Project Plan

APPENDIX L

A RESOLUTION ADOPTING A FINAL PROJECT PLAN NING DOCUMENT

FOR WATER SYSTEM IMPROVEMENTS

AND DESIGNATING AN AUTHORIZED PROJECT REPRESENTATIVE

WHEREAS, the	City of Bronson			r	ecognizes	the need	to	make
improvements to its exist	ing water treatment and dist	tribution	n system; a	nd				
WHEREAS, the	City of Bronson			<u>a</u>	uthorized			
Prein&Newhof		to	prepare	а	Project	Planning	Document,	which
recommends the constructi	ion of							

WHEREAS, said Project Planning Document was presented at a Public Hearing held on

<u>April 10th at 5pm</u> and all public comments have been considered and addressed;

NOW THEREFORE BE IT RESOLVED, that the_				City of Bronson								
formally	adopts	said	Project	Planning	Document	and	agrees	to	implement	the	selected	alternative
(Selected Alternative Description)												

BE IT FURTHER RESOLVED, that the <u>(title of the designee's position)</u>, a position currently held by <u>(name of the designee)</u>, is designated as the authorized representative for all activities associated with the project referenced above, including the submittal of said Project Planning Document as the first step in applying to the State of Michigan for a Drinking Water State Revolving Fund Loan to assist in the implementation of the selected alternative.

Yeas (names of Members voting Yes):

Nays (names of Members voting No):

I certify	that the above Resolution	was adopted by	(the applicant's governing body)	
on	(date of adoption)			

BY:

Name (please print or type)

Title

signature

Date

Overburdened Community Determination Worksheet

Prein&Newhof



MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

OVERBURDENED AND SIGNIFICANTLY OVERBURDENED COMMUNITY STATUS DETERMINATION WORKSHEET

The following data is required from each State Revolving Fund (SRF) applicant requesting a determination for overburdened and significantly overburdened community status.

The most recent census and tax data are available in a searchable table on EGLE's <u>State Revolving</u> <u>Fund – Overburdened Community Definition and Scoring Criteria Development</u> webpage along with an excel worksheet to help determine blended Median Annual Household Income (MAHI) and blended taxable value per capita for regional systems. The MAHI and taxable value per capita table will be used to make all FY24 determinations. Applicants are encouraged to visit this page prior to completing this form to see if they qualify based on MAHI (blended MAHI if applicable) or taxable value per capita (blended taxable value per capita if applicable) alone. If so, they only need to fill out lines 1 and 2 of this form, electronically sign it on page 2, and submit.

Alternately, if the applicant's MAHI or blended MAHI is above the state average - \$63,498 for FY24 – they cannot be determined as being overburdened or significantly overburdened for FY24 funding and should not complete or turn in this form.

For applicants whose MAHI or blended MAHI is below \$63,498 but do not automatically qualify based on MAHI or taxable value per capita alone, please complete the entire form and return to:

Mark Conradi conradim@michigan.gov

Name of Applicant

Please check the box indicating which funding source this determination is for:

DWSRF 🗆

CWSRF

1. Is this a regional system? A regional system refers to any system that serves more than one municipality (cities, townships, and/or villages)

Yes	
No	

If yes, refer to the instructions at the end of this form to complete calculations for a blended MAHI and blended taxable value per capita. Additionally, page 3 of this form will also need to be completed.

- **2.** Median Annual Household Income from table on the overburdened webpage (blended if applicable)
- **3.** Taxable Value Per Capita from table on the overburdened webpage (blended if applicable)
- **4.** Total amount of anticipated debt for the proposed project (amount of loan requested for FY24 loan)
- **5.** Annual payments on the existing debt for the system
- **6.** Total operation, maintenance, and replacement expenses (OM&R) for the system on an annual basis
- 7. Number of residential equivalent users (REUs) in the system

*I (_____) hereby certify that the information in this form is complete, true, and correct to the best of my knowledge.

Signature

Date

For determinations made using anticipated debt, a final determination will be made based upon the awarded loan amount and not the anticipated amount provided on this form.

Regional System Breakdown (If applicable)

Name of municipality	Percentage of flow
Name of municipality	Percentage of flow
Name of municipality	Percentage of flow
Name of municipality	Percentage of flow
Name of municipality	Percentage of flow
Name of municipality	Percentage of flow
Name of municipality	Percentage of flow
Name of municipality	Percentage of flow
Name of municipality	Percentage of flow
Name of municipality	Percentage of flow
Name of municipality	Percentage of flow
Name of municipality	Percentage of flow
Name of municipality	Percentage of flow
Name of municipality	Percentage of flow
Name of municipality	Percentage of flow

If more spaces are needed, please include them in the email along with this submission. Percentages of flow must add up to 100%.

OVERBURDENED AND SIGNIFICANTLY OVERBURDENED COMMUNITY STATUS INSTRUCTIONS AND GUIDANCE

The following instructions provide guidance to fill out the overburdened and significantly overburdened determination community status worksheet. Systems across the state use many types of methods for billing and some include items that others do not. The purpose of the determination is to put all systems on a level playing field by breaking down system debt, expenses, and number of customers in the same manner. The instructions address each question in the order they are presented on the worksheet.

1. Regional systems (if applicable) – Blended MAHI and taxable value per capita calculations

The definition of overburdened and significantly overburdened communities first requires "(a) Users within the area served by a proposed drinking water project, sewage treatment works project, or stormwater treatment project are directly assessed for the costs of construction." That means that the calculations need to be based on who is paying for the proposed SRF loan.

For systems that serve more than one municipal entity a blended MAHI and taxable value per capita calculation must be completed. Page 3 of the worksheet includes spaces for a system to list all the municipalities (cities, townships, and/or villages) and the percentage of flow they provide to the system. The flow percentages should be based on the most recent data available.

The reason flow is used is because most systems add debt costs to customers' bills and those are determined by flow. In rare cases there might be municipal agreements that vary slightly from this method and those will require the applicant to contact EGLE and provide the data separate from this worksheet. EGLE will take each municipality's MAHI and taxable value per capita and multiply it by the percentage of flow and then add them all together to come up with the blended number to be used in the determination (e.g., (municipality A MAHI * flow) + (municipality B MAHI * flow) + (municipality C MAHI * flow = Blended MAHI for the system)). The same formula will be repeated swapping out taxable value per capita for MAHI to determine a blended taxable value per capita.

The most recent census and tax data are available in a searchable table on EGLE's <u>State</u> <u>Revolving Fund – Overburdened Community Definition and Scoring Criteria Development</u> webpage. This table will be used to make all FY24 determinations. Use the excel FY24 Overburdened Calculation Template also located on the <u>State Revolving Fund – Overburdened</u> <u>Community Definition and Scoring Criteria Development</u> webpage. Tab 1 titled, "Blended MAHI and TVPC calcs" will allow the applicant to input the names of the municipalities, their percentage of flow, the MAHI for each found in the table listed above, and the taxable value per capita for each in the table listed above, to calculate a blended MAHI and blended taxable value per capita of the regional system. If the blended MAHI is above \$63,498 the project cannot qualify for overburdened or significantly overburdened status and the rest of the form should not be filled out or turned in.

2. Median Annual Household Income

Use the "Fiscal Year 2024 Overburdened Median Annual Household Income (MAHI) and Taxable Values List for SRF Projects; the State of Michigan MAHI is \$63,498 for FY24 Projects" searchable table located on the <u>State Revolving Fund – Overburdened Community Definition</u> <u>and Scoring Criteria Development</u> webpage. Search for the system's MAHI and enter it. **If the**

MAHI is above \$63,498 the project cannot qualify for overburdened or significantly overburdened status and the rest of the form should not be filled out or turned in.

For regional systems that serve more than on municipality (cities, townships, and/or villages), refer to the instructions for regional systems in step 1 if you have not already completed calculating a blended MAHI for the system. Once the blended MAHI is determined, enter it on line 2 of the worksheet.

3. Taxable Value Per Capita

This data is found in the same location as the MAHI data and was likely already entered by the applicant while completing line 2. If not, repeat the directions for step 2 and enter the taxable value per capita from the table.

For regional systems that serve more than on municipality (cities, townships, and/or villages), refer to the instructions for regional systems in step 1 if you have not already completed calculating a blended taxable value per capita for the system. Once the blended taxable value per capita is determined, enter it on line 3 of the worksheet.

4. Total amount of anticipated debt for the proposed project

Fill in the total amount of the proposed loan for the project requesting State Revolving Loan financing in FY24.

EGLE will amortize this amount to determine a yearly cost to the applicant. The excel FY24 Overburdened Calculation Template, also located on the <u>State Revolving Fund – Overburdened</u> <u>Community Definition and Scoring Criteria Development</u> webpage, has this calculation built in so the applicant only needs to enter full FY24 the loan amount when completing that as well.

Note that this loan amount is an estimate and often changes after project plans are submitted and bids come in. EGLE will run this determination again prior to finalizing the Project Priority List (PPL). Changes in the loan amount can sometimes change an applicant's status from overburdened to not or vice versa if the initial calculation is close to the 1% MAHI threshold.

Thus, if a system is determined to be overburdened or not based on annual user costs being greater than 1% of system's MAHI vs being determined overburdened by MAHI or state taxable value per capita alone, a loan amount will be provided to the applicant that provides the cutoff loan value to either gain or lose overburdened status.

5. Annual Payments on the existing debt of the system

Fill in the yearly total of any current debt payments for the system. If coming in for a CWSRF project only include debt payments for the wastewater system and if coming in for a DWSRF project only include debt payments for the drinking water system.

In a regional system the additional debt payments of connected systems may be added if the connected systems are included in the blended MAHI and taxable value per capita calculations and there is no double-counting. For example, if a regional treatment system is coming in for the loan, a connected collection system could add any additional annual debt costs that the
collection system passes onto its customers after paying all debt and expenses to the regional treatment system. This is to account for the fact that the MAHI and state taxable values are being blended so the annual debt payments of the regional system can be blended as well to determine the average user cost of the regional system.

6. Total operation, maintenance, and replacement (OM&R) expenses for the system on an annual basis

As with the annul debt payments, the amount listed here should include only wastewater OM&R for CWSRF loans and only drinking water OM&R for DWSRF loans. If the accounting is combined split the costs as accurately as possible.

The OM&R costs should reflect all annual expenses for the system that are recovered annually through rates. This means that if a community makes an annual contribution of \$50,000 a year to a capital improvement fund, they could add that number to the yearly OM&R costs. If they have accumulated \$250,000 in that account and plan on using all in the calendar year they are applying for the loan, they cannot claim that amount as it is not a yearly expense; only the \$50,000 is. This is also true for depreciation expenses with no cash value or yearly contribution. They cannot be included.

In a regional system the additional OM&R expenses of connected systems may be added if the connected systems are included in the blended MAHI and taxable value per capita calculations, there is no double-counting, and the expenses follow the same OM&R rules listed above. For example, if a regional treatment system is coming in for the loan, a connected collection system could add any additional annual OM&R costs that the collection system passes onto its customers after paying all debt and expenses to the regional treatment system. This is to account for the fact that the MAHI and state taxable values are being blended so the annual OM&R expenses of the regional system can be blended as well to determine the average user cost of the regional system.

7. Number of residential equivalent users (REUs) in the system

REUs refer to number of standard household hookups in a system. In a bedroom community, with little to no commercial or industrial customers, this number clear. However, most systems have a combination of customer types. The purpose of this form is to determine the average bill for a typical residential customer to determine if it is high enough to pose a burden on the ratepayer.

There are two standard ways of determining REUs: meter size and average flow.

• Meter size

This is the preferred method as it eliminates most variables that using flow may have. To determine the number of REUs in a system take all the systems' meters and convert them down to 5/8^{ths}-inch or ³/₄-inch (whichever is the system's standard residential size). Use the capacity of the pipe to convert down (e.g., a 2-inch meter would be equivalent to about 8, 5/8^{ths}-inch meters, a 4-inch meter would be equivalent to about 25, 5/8^{ths}-inch meters, etc.). The resulting number of equivalent 5/8^{ths}-inch or ³/₄-inch meters would be the number of REUs in the system.

• Average flow

The average flow method requires the system to determine the average yearly flow for a typical residential household (i.e., a 5/8^{ths}-inch or ³/₄-inch connection). The system takes the most recent yearly flow data of the entire system and divides by the average household usage number to come up with the number of REUs.

EGLE will look at the numbers provided and may have questions based on the population size vs number of REUs. EGLE will reach out and ask to see the calculations in some instances. Applicants are encouraged to include an excel sheet with these calculations along with the submittal of this form to reduce any back-and-forth communications.

Signature

A typed name and accompanying electronic signature are required for the form to be accepted. If this section is left blank the form will be returned to the sender and not reviewed until it has been signed and sent back.

Final Determination

If the system's MAHI or blended MAHI (if applicable) is over the state average - \$63,498 for FY24 – it cannot be determined as being overburdened or significantly overburdened for FY24 funding.

EGLE will take the information provided on this form and enter it into the FY24 Overburdened Calculation Template spreadsheet to calculate the average yearly cost per REU. If a community or system is not determined to be overburdened or significantly overburdened based on MAHI or taxable value per capita alone, this calculation will determine if the costs are greater than 1% of the system's MAHI.

The FY24 Overburdened Calculation Template spreadsheet with the calculations and final determination will be sent to the applicant after the review has been completed by EGLE. A blank version is available on the <u>State Revolving Fund – Overburdened Community Definition and Scoring</u> <u>Criteria Development</u> webpage. Ideally the applicant has already completed the calculations using the instructions above prior to submitting. If the applicant completes the worksheet and determines they do not qualify for overburdened status it is requested that they do not submit the completed worksheet unless they have questions. The applicant's preliminary findings using the FY24 Overburdened Calculation Template are not official until they have been reviewed by EGLE as discrepancies and/or questions about some of the numbers may arise. However, EGLE is providing the template to allow applicants to have a good idea of how the determination will result prior to hearing back officially from EGLE.

Please contact Mark Conradi (<u>conradim@michigan.gov</u>) with any questions on the completion of the form.

If you need this information in an alternate format, contact <u>EGLE-Accessibility@Michigan.gov</u> or call 800-662-9278.

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This form and its contents are subject to the Freedom of Information Act and may be released to the public.