DRINKING WATER STATE REVOLVING FUND (SRF)
Project Plan

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

CITY OF ST. LOUIS

DRINKING WATER SYSTEM IMPROVEMENTS

City of St. Louis
Gratiot County, MI

DRAFT

Prepared By:
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I. PROJECT BACKGROUND

A. DELINEATION OF STUDY AREA

The City of St. Louis is in Gratiot County along the M-46 corridor, approximately 35 miles west of Saginaw and 50 miles north of Lansing. The City is approximately 3.5 square miles in area and is home to approximately 7,265 residents including MDOC facilities. The City owns and operates its own public water distribution system that is supplied with treated drinking water by the Gratiot Area Water Authority (GAWA).

The City's drinking water distribution system includes approximately 32.2 miles of water main, two (2) elevated storage tanks, one 500,000-gallon tank located on West Crawford Street and one 200,000-gallon tank located on Giddings Street. and two (2) 16-inch water main connections with booster pump stations to the GAWA transmission mains. The water that is received from GAWA is metered through the two booster pump stations which control the volume of flow using flow controlling valves. The purchased water from GAWA has already been treated and is fit for consumption.

The City is pursuing funding through the Michigan Department of Environment, Great Lakes, and Energy (EGLE) Drinking Water Revolving Fund (DWRF) to support the identification, removal, and replacement of lead services that are affected by Lead and Copper Rule regulations. The proposed project will include the following:

- Identification of approximately 1,000 water services with unknown materials.
- Replacement of all lead water services found with an estimated 600 services in need of replacement.

It is important to note that the City has applied for a Drinking Water Asset Management Grant through the State of Michigan. As of May 2021, the City has not been awarded Grant money. If the City receives funds in the future, the proposed 1,000 water services will be removed from this project and will be completed through the DWAM Grant project.

B. LAND USE

The City of St. Louis encompasses approximately 3.5 square miles in area and currently participates in the Gratiot County Master Plan for land use planning. The future land use is comprised of 14 general land use categories that include downtown/mixed use, office/technology, general commercial, general mixed use, heavy industrial, light industrial, agriculture, multi-family residential, neighborhood residential, manufactured housing community, rural residential, public/quasi-public, natural and open space, and recreation. It is anticipated that current trends in the City will remain consistent and land use will remain relatively consistent over the next 20 years. Additionally, there are no development trends that would indicate negative impacts to the air and water quality of the City. A current zoning map can be found in Appendix A.

C. POPULATION PROJECTIONS

Population projections for the City of St. Louis have been obtained from EMCOG through calendar year 2045. The following table summarizes the population projections:

CITY OF ST. LOUIS POPULATION PROJECTIONS							
City of St. Louis	Estimated 2015	Estimated 2020	Estimated 2025	Estimated 2030	Estimated 2035	Estimated 2040	Estimated 2045
	7,237	7,047	6,977	7,003	7,069	7,116	7,098

Table 1 - Population Projections

D. WATER DEMAND

Per the most recent Water Reliability Study that was completed in November 2018, the current water demand is showing a 4.3 percent growth in future water use. The following table shows the 5-year and 20-year projections.

Category	Present (gpd)	Future Year 2022 (gpd)	Future Year 2037 (gpd)
Average Daily Demand	900,000	910,000	940,000
Maximum Day Demand	1,210,000	1,220,000	1,260,000
Peak Hourly Demand	1,820,000	1,830,000	1,890,000

Table 2 - Water Demand Projections

As mentioned previously in this plan, the City receives water from two (2) connections to the GAWA transmission system. The City is currently in the process of abandoning the existing water system wells due to a contamination plume in the aquifer. It is anticipated that the GAWA system will provide drinking water to the City indefinitely.

E. EXISTING FACILITIES

Condition of source facilities

The City currently purchases water from GAWA which provides quality drinking water. The existing emergency backup wells are currently being decommissioned with continuation of service being provided by GAWA. The wells that support GAWA are located in the City of Alma and Arcada Township with the six (6) total wells producing a firm capacity of 3,475 gpm with additional capacity being drawn from the Pine River. The water treatment plant underwent an upgrade in 2012 which increased the rated capacity of the facility from 4.0 MGD to 6.0 MGD. The upgrade included installation of three (3) new groundwater supply wells, treatment works upgrades, and various water storage upgrades. A fourth production well has been approved and scheduled to come online in 2022. Future growth models show that the firm capacity of the water treatment plant is well above the projected 20-year maximum day and peak hour demands.

Method of water treatment

As taken from the most recent water reliability study, “the GAWA water treatment plant uses up flow, solids contact clarifiers for lime-soda ash softening in a split treatment configuration. Coagulation is augmented with ferric chloride in both stages of pretreatment with provisions to add polymer if needed. The settled water from pretreatment is filtered through three relatively large media filters before storage and distribution. The filters utilize sand and anthracite media. Sulfuric acid is used occasionally, as needed, for pH control, but is being used sparingly as river water is relied upon less as a raw water source. Sodium Hypochlorite is used to disinfect the water. The water treatment plant also has capacity for powdered activated carbon feed for taste and odor control on an as-needed basis.”

Condition of service lines

The City currently shows 1,412 services throughout the distribution system. The following table shows the breakdown of materials that are tracked by the City.

Water Service Material	Present (gpd)
Known galvanized previously connected to lead (GPCL)	38
Unknown – No information	403
Unknown – Likely not lead	562
No Lead or GPCL	409
Total	1,412

Table 3 - Water Service Materials

Watermain Distribution Mains, Valves, Hydrants, Fire Flows, Pressure

Per the most recent asset management plan, the City has identified all water distribution mains by age and diameter. The following table shows the installation decade of all watermains in the distribution system.

Decade	Percent of System Installation	Cast Iron	Ductile Iron	PVC	Asbestos Cement
1920	-	-	-	-	-
1930	26.9%	~19.0%	-	-	~7.9%
1940	-	-	-	-	-0
1950	1.9%	1.9%	-	-	-
1960	31.4%	~24%	~0.4%	-	~7.0%
1970	3.4%	3.4%	-	-	-
1980	2.7%	~2.0%	~0.7%	-	-
1990	15.7%	~4.5%	~3.7%	~7.5%	-
2000	4.9%	-	~2.5%	~2.4%	-
2010	13.0%	-	-	13.0%	-
Total	100%	~54.8%	~7.3%	~22.9%	~14.9%

Table 4 - Watermain Material and Age

Additionally, the City's breakdown of watermain length and diameter is shown in the following table.

Diameter	Length of Main (ft)	Percentage of Total
<4 inches	294	0.2%
4 inches	39,167	23.0%
6 inches	40,572	23.8%
8 inches	8,937	5.2%
10 inches	25,649	15.0%
12 inches	37,961	22.3%
14 inches	1,577	0.9%
16 inches	16,584	9.7%
Total	170,448	100.0%

Table 5 - Watermain Diameter and Length

Based on the most recent asset management plan, the water distribution mains are in good condition with a capital improvement plan outlined for the City to follow. A copy of the asset management plan is included in Appendix B. The following table summarizes the 20-year capital improvement plan that the City is currently following.

Project No.	Project Description/Location	Replacement Main Diameter (in)	Main Length (ft)	Main Unit Cost ($/ft)	Water Main Cost
1	New water main from the corner of Prospect and Hebron Street down to the end of Orchard Court	8	3,500	$205	$718,000
2	Replace mains along Devon Street	8	2,600	$249	$647,000
3	Replace mains along Franklin Street from Saginaw Street to State Street	8	3,300	$249	$822,000
4	Replace mains along Prospect from Seaman to dead end to east	8	1,500	$249	$374,000
5	Replace main along Locust Street from Maple Street to Mill Street	8	700	$249	$174,000
6	Replace mains along Main Street from Washington to the bridge	8	1,400	$264	$370,000
7	Replace 4-inch mains along Euclid Street	8	2,900	$249	$722,000
8	Install main along Walnut from Main Street to East Street and down East Street to Butternut	8	2,400	$249	$598,000
9	Replace 4-inch mains along Hazel Street	8	1,600	$249	$398,000
10	Replace mains along Corinth Street from Olive Street to dead end to the north	8	1,000	$249	$249,000
11	Replace mains along Prospect from Corinth to Teaman Street	8	900	$264	$238,000
12	Replace mains along Berea, west along Tamarack to Eden Street	8	1,700	$264	$449,000
13	Replace mains along Bankson from Tyrell to North Street	8	2,000	$249	$498,000
14	Replace mains along Prospect from Hebron to Teaman, north up Teaman to Olive	12	1,600	$281	$450,000
15	Replace mains along Olive Street from Corinth to Main	12	1,400	$281	$393,000
16	Replace mains along I & K from Main to Union	12	1,200	$281	$337,000
17	Replace 4-inch mains along Lincoln Street	8	1,100	$249	$274,000
18	Replace mains along Center Street from Watson to Main	8	2,200	$249	$548,000
19	Replace mains along Graham Street from Wilson to Woodside	8	1,400	$264	$370,000
20	Replace mains along Pine Street from Washington to North Street	8	1,600	$249	$398,000
21	Replace main along Butternut from East to Euclid Street	8	1,500	$249	$374,000
22	Replace mains along Mill Street from Hazel to State Street	8	1,300	$264	$343,000
23	Replace mains along Delaware Street from Crawford to North Street	8	2,500	$249	$623,000
24	Replace mains along East Street from Washington to State	8	2,800	$249	$697,000

Project No.	Project Description/Location	Replacement Main Diameter (in)	Main Length (ft)	Main Unit Cost ($/ft)	Water Main Cost
25	Replace mains along Sharon Street from Olive to Prospect Street	8	1,100	$249	$274,000
26	Replace mains along Maple Street from Hazel to State Street	8	1,600	$249	$398,000
27	Replace mains along Surrey from Devon to dead end	8	1,700	$249	$423,000
28	Replace mains along Essex Street from Devon to York Street	8	900	$249	$224,000
Cost of 20-Year Distribution System Improvements					$12,383,000

Table 6 – 20 Year Distribution System Improvements Capital Improvement Plan

The City owns and operates 634 isolation valves. These valves are documented through location only with the valve number, size and type being documented through the City's normal operation and maintenance of the system.

The City also owns and operates 245 fire hydrants. An inventory of the hydrants in the system is maintained in the City's general plan map, however, only the location of each hydrant is currently known. The hydrant number, size, and type will be collected by the City in ongoing maintenance of the hydrants. Based on this practice, the fire hydrants are in good condition with low probability of failure.

Currently, the City experiences approximately 10 water main breaks per year. The locations are not currently tracked, however, the lost water amounts are tracked on an annual basis. On average, the City purchases approximately 260 MG. 245 MG of the purchased water is billed resulting in an average water loss of approximately 5%.

The City has several areas with available fire flows below the 1,500-gpm target. Specific improvements are detailed in the most recent water reliability study and the City is currently following the capital improvements that have been outlined. A copy of the water reliability study can be found in Appendix B.

Method of residuals handling and disposal.

Chlorine residuals handling and disposal is typically conducted during new watermain installation. After the required duration of chlorination, the watermains are then flushed and the water is disposed of in a nearby storm sewer system.

Condition of water meters.

Overall, the water meters are in good condition and are radio read Sensus meters. The City changes out meters on a regular basis with overall low water loss. Each year a portion of the water meters are changed with a goal of having the entire system updated within 7 years.

Discussion of O&M requirements including any problems being experienced such as excessive flushing, leakages, breaks, etc.

The City's O&M requirements consist of normal watermain replacement through the capital improvement plans as identified in the water asset management plan and water reliability study. The City is currently in the process of abandoning the existing water supply wells due to a chemical plume

that has rendered supply water unfit for consumption. The valves and hydrants currently are being updated in the GIS system as discussed in the water asset management plan. Each month the purchased water is compared to the billed water to determine water losses. Over the last four years there has been an average of 5-5.5% water losses throughout the year. Some of the lost water is tracked through hydrant flushing and tracked municipal uses, making water losses quite low overall with the main cause being watermain breaks. These watermain breaks typically occur in the winter months due to annual frost levels affecting the older cast iron water mains. Due to the previous few winters being relatively mild, the watermain breaks that are occurring are typically due to defects in the pipe that occur due to the pipe having reached its end of useful lifespan.

Design capacity of the waterworks system and the existing uses of available capacity.
The current design capacity for the St. Louis water system is provided through two 16-inch transmission mains from the GAWA system. Each main has a dedicated booster pump station that provides flow to the City. The Cheesman Booster Pump Station was constructed on the northern transmission main with a firm capacity of 2.45 mgd. The Michigan Booster Pump Station was constructed on the southern transmission main with a firm capacity of 3.0 mgd. Based on data provided in Table 2: Water Demand Projections, both booster pump stations are individually capable of providing sufficient flow to the City in the 2037 estimates for peak water demand.

An evaluation of the systems climate resiliency.
The City's main water source is provided by GAWA as stated previously in this project plan. The water reliability study describes that the St. Louis distribution is fed via gravity flow during a typical average demand day. This is the result of the St. Louis water system running at a lower hydraulic grade line than the Alma water system. In the event of power failure or severe weather, the St. Louis distribution should remain relatively unaffected. The GAWA water treatment plant is equipped with emergency backup power capabilities which allow for continuous operation during normal power failure. With the St. Louis water towers being filled via gravity during average operations, inclement weather should not affect the system. Under peak demands, the City would rely on emergency backup power to allow for operation of the booster station capabilities to fill the water towers.

F. SUMMARY OF PROJECT NEED

The City of St. Louis has a been committed to providing quality drinking water to the residents through active repair and maintenance of distribution assets. In 2015 the City switched the source water from locally operated well water to the GAWA treated water distribution system. This operation removed all drinking water quality problems that had been identified with the local well water source. With the emergence of the lead and copper rule of 2018, the City has been actively engaged in the identification and replacement of lead services throughout the community. Due to the prevalence of COVID-19 throughout the state of Michigan and the corresponding social restrictions, the City's progress towards compliance with the lead and copper rule has been restricted.

The proposed project will allow the City to address the following:

- Identification of approximately 1,000 water services with unknown materials.
- Replacement of all lead water services found with an estimated 600 services in need of replacement.

This project will provide the City residents with high quality drinking water through the removal of lead services as well as providing regulatory compliance with the Lead and Copper Rule of Michigan. Currently, the City has been replacing lead services that have been identified throughout normal

watermain projects and miscellaneous operation and maintenance services. This practice has been allowing the City to systematically comply with the Lead and Copper Rule, however, it was found that the City has been determined to be disadvantaged by the State of Michigan. To complete the identification, removal, replacement, and final system inventory a State Revolving Loan will be pursued. This loan will allow the City to complete the final system inventory as well as compliance with the Lead and Copper Rule by January 1, 2025.

The needs of the City are detailed in the latest version of the water asset management which can be found in Appendix B. The capital improvement plan shows approximately 1.78% of the water mains in the system being replaced each year. The 5-year capital improvement plan replaces approximately 15,200 linear feet of water main for a total estimated cost of $4,139,000. The 6-20 year capital improvement plan replaces approximately 45,305 linear feet of water main for a total estimated cost of $11,550,000. These projects are prioritized by business risk scoring, which is updated annually. The capital improvement plan also includes miscellaneous projects for the distribution system such as water tower painting, fire hydrant repainting, water department garage painting, security fencing, and developing city engineering standards. The current rate structure has been developed around this capital improvement plan and funding is not being sought for these projects. Due to the emergence of the Lead and Copper Rule, funding was not anticipated for this work, therefore, the City is pursuing the DWRF low interest loan.

G. EXPLORATORY WELL INVESTIGATIONS, WELL SITE SELECTION, TEST WELL DRILLING PROCEDURES

This section does not apply to the project.

II. ANALYSIS OF ALTERNATIVES

A. WATER SYSTEM IMPROVEMENTS

As stated earlier in the project plan, the proposed project consists of the following:

- Identification of approximately 1,000 water services with unknown materials.
- Replacement of all lead water services found with an estimated 600 services in need of replacement.

These water system improvements will provide the City with regulatory compliance as dictated through the Lead and Copper Rule. The following alternatives will be considered to the proposed project.

B. NO-ACTION

The first alternative to the proposed project is no-action. This alternative would put the City into non-compliance with the Lead and Copper Rule and therefore is not feasible. Further evaluation of this alternative will not be needed.

C. OPTIMUM PERFORMANCE OF EXISTING FACILITIES

The second alternative to the proposed project is to review the operation procedures of the City to determine if optimum performance of existing facilities has been achieved. The proposed project is being conducted to complete the City's requirements for compliance with the Lead and Copper Rule. This project will evaluate the remainder of the City's water services that are of unknown material.

The nature of the proposed project pertains to the material components of water services and therefore does not apply to system performance. This alternative will not be further evaluated.

D. REGIONAL ALTERNATIVES

The City's water supply is currently being provided by GAWA. The system is therefore already part of a regional system. This alternative will not be further evaluated.

III. PRINCIPAL ALTERNATIVES

A. MONETARY EVALUATION

Present Worth

The full cost analysis and preliminary cost estimates for the Water System Improvements project can be found in Appendix C. The following table is a summary of the results of the analysis:

Monetary Evaluation – Water System Improvements		
	No Principal Forgiveness	Including $3m Principal Forgiveness
Capital Improvement Costs	$4,900,000	$1,900,000
Annual O&M Costs	$1,738,537	$1,738,537
Future Salvage Value	$5,000	$5,000
Present Worth of O&M	$36,665,109	$36,665,109
Present Worth of Salvage	$5,527	$5,527
Total Present Worth	$41,559,582	$38,665,109
Number of REU's	3,589	3,589
Estimated Interest Rate	1.875%	1.875%
Principal Loan Amount	$4,900,000	$1,900,000
Estimated Loan Duration	20 years	20 years
Estimated Yearly Payment	$296,065.25	$114,800.81
Estimated Quarterly Payment Per REU	$20.62	$8.00
Interest During Construction	N/A	N/A

Table 7 - Monetary Evaluation

Discount Rate

The current real discount rate used in computing the present worth costs has been established to be -0.5% as found in Appendix C of the OMB Circular No. A-94.

Salvage Value

The proposed project will replace existing water services. The proposed materials will be copper water services with stainless steel saddles, brass corp and curb stop, and ductile iron valve boxes. The proposed materials will all have useful lives of 30 to 50 years. At the end of the 20-year loan, it will be assumed that any materials that could be salvaged, i.e., valve boxes, valve stems, etc., would have a salvage value of $5,000.

Escalation

There are no components to the proposed project that will be eligible for escalation.

Interest During Construction

The estimated construction period of the project will be less than one year, therefore, no interest during construction is being calculated.

FMAR, PDB, FPDB Delivery Method
This section does not apply to the proposed project.

B. ENVIRONMENTAL EVALUATION

Cultural Resources
Per EGLE resources and conversations with the EGLE project manager, this project will be an equivalency project and therefore the State Historical Preservation Officer (SHPO) and Tribal Historic Preservation Officers (THPO) will be conducted by EGLE staff.

It should be noted that the Downtown area in the City has been registered as a historical district a few years ago. While the area is considered historical, there are no known specific buildings to note during a SHPO review.

The Natural Environment
Per EGLE resources and conversations with the EGLE project manager, this project will be an equivalency project and therefore the State Historical Preservation Officer (SHPO) and Tribal Historic Preservation Officers (THPO) will be conducted by EGLE staff.

1. Climate: The project location is found in central Michigan with yearly temperature ranges from below freezing to approximately 80-90 degrees Fahrenheit. It is generally considered that the Michigan construction season begins in early April and lasts until late November or early December where winter conditions produce unfavorable working conditions. The frost depth in lower Michigan is generally considered to be 42-inches below grade with underground utilities buried below this depth.
2. Air Quality: Michigan air quality is typically considered moderate to good quality with AQI index valves between 20 and 100. The proposed project will not be impacted by air quality nor will it affect future air quality.
3. Wetlands: A map of the documented wetlands can be found in Appendix A. The proposed work will be the replacement of existing water services throughout the City. The construction footprint of each service will be small and will replace existing infrastructure. Therefore, no wetlands will be disturbed during this process.
4. Coastal Zones
   a) There are no coastal zones in the study area.
5. Floodplains: A map of the documented floodplains can be found in Appendix A. The proposed work will be the replacement of existing water services throughout the City. The construction footprint of each service will be small and will replace existing infrastructure. Therefore, no floodplains will be disturbed during this process.
6. Natural or Wild and Scenic Rivers
   a) There are no rivers impacted in the study area.
7. Major Surface Waters
   a) There are no major surface waters in the study area.
8. Agricultural Resources
   a) The City of St. Louis has a minimal amount of farmland throughout the City boundary. Most of the surrounding land outside the City boundary is classified as farmland. No farmland will be affected by the proposed project.
9. Existing flora/fauna and environmentally sensitive habitats

a) The existing flora/fauna of the area is typical of central Michigan. The proposed project will replace water services within existing road right-of-ways as well as residential properties. No flora/fauna will be disturbed by the proposed project.

C. MITIGATION

The project will involve numerous excavations throughout the City in two phases of construction. It is anticipated that traffic control, homeowner access, access to commercial businesses and properties, and construction disturbances will require mitigation throughout the project. Each of these mentioned impacts to the community have been accounted for in the preliminary estimate of cost that was developed for the project. During project design traffic control and coordination for access to homes and businesses will be included in the plans and specifications to ensure minimal disturbances throughout construction.

D. IMPLENTABILITY AND PUBLIC PARTICIPATION (*SECTION TO BE UPDATED AFTER PUBLIC HEARING ON JUNE 15*)

The proposed project has been discussed at the February 23, 2021 special City Commission meeting where the Project Plan development was awarded to Spicer Group, Inc. Additionally, the formal public hearing was held on June 15, 2021 which received no comments from the public.

E. TECHNICAL CONSIDERATIONS

The proposed alternative for the identification and replacement of lead services follows the design standards established in the "Recommended Standards for Waterworks". The project will update the distribution system to current standards and replace all identified lead and galvanized service lines with copper service lines.

F. RESIDUALS

The proposed project is not anticipated to produce any chlorine residuals. During installation of the new water services, chlorine will be used to swab the components that are being installed. It is anticipated that concentration of chlorine used in this process will not be a factor in the overall volume of drinking water to the customers.

Industrial/Commercial/Institutional

No high-volume users will be affected by design flows/pressure for the proposed project. The proposed project will not affect the available pressures or fire flow capacities of the distribution system.

Growth Capacity

The proposed project will only focus on existing water services. The growth capacity of the City will not be affected by the project.

G. CONTAMINATION

The proposed project site was examined for possible contaminated sites throughout the City. The following sites were identified using EGLE's Environmental Mapper:

1. Land use Restrictions:
   a) The City of St. Louis does not have any land use restricted sites.

2. Leaking Underground Storage Tanks:
    a) The City has 11 leaking underground storage tanks located throughout the community. These sites are listed as "Part 213 Open" and may need to be considered during the design and construction of the proposed project.
    b) The City has 13 leaking underground storage tanks located throughout the community. These sites are listed as "Part 213 Closed" and may need to be considered during the design and construction of the proposed project.
3. Sites of Environmental Contamination
    a) The City has 18 sites of environmental contamination throughout the community. Out of the 18 sites, two have risks present and are immediate. These sites are the Velsicol Burn Pit, located at 1270 W. Monroe Road and the former Clark Station located at 220 W. Washington Avenue.
4. Underground Storage Tanks
    a) The City has five (5) underground storage tanks that are actively being used throughout the community. There is no anticipated contamination from any of the existing storage tanks.
    b) The City has 29 underground storage tanks that are listed as closed throughout the community. There is no anticipated contamination from any of these sites.
5. Brownfield Redevelopment
    a) The City has one Brownfield Grant location which is the former Clark Station, located at 220 W. Washington Avenue.
6. Wellhead Protection Areas
    a) The City has numerous areas that qualify for Type 1 and Type 2 wellhead protection areas.
        i. Type 1 Traditional WHPA – Located throughout the central portion of City, this wellhead protection area encompasses most of the residential and commercial areas of the community.
        ii. Type 1 Provisional WHPA – A small area in the southern spur of the City has been identified as a Type 1 Provisional wellhead protection area. This location ranges from Jackson Road to north of Cheesman Road with the central location being the entrance of Horse Creek to the Pine River.
        iii. Type 2 Provisional WHPA – There are five (5) Type 2 Provisional wellhead protection areas to the immediate west of City limits. It is not anticipated that these locations will be within the study area.

Maps of all contamination locations can be found in Appendix A. All locations will be reviewed during design and prior to construction to determine if special needs be taken at each proposed excavation.

H. NEW/INCREASED WATER WITHDRAWALS

This section does not apply to the proposed project.

IV. SELECTED ALTERNATIVE

A. DESIGN PARAMETERS

The proposed project will allow the City to address the following:

- Identification of approximately 1,000 water services with unknown materials.

- Replacement of all lead water services found with an estimated 600 services in need of replacement.

The water service replacement will specifically address compliance with the Lead and Copper Rule mandated by EGLE. Since this work is being driven by the EGLE mandate, no other alternative is feasible for this work.

B. HYDROGEOLOGICAL ANALYSIS

This section does not apply to the proposed project.

C. FINALIZATION OF WELL DESIGN

This section does not apply to the proposed project.

D. MAPS

Please refer to Appendix A for maps detailing the proposed project study area, applicable environmental features, etc.

E. SCHEDULE FOR DESIGN AND CONSTRUCTION

The proposed project is preparing for third quarter funding in FY 2022. Therefore, the following schedule will be followed for the design and construction of the proposed project:

July 1, 2021	Project plan deadline
October 1, 2021 +/-	EGLE determination of accepted project funding or not.
October 15, 2021 +/-	Begin project design.
January 2022 +/-	EGLE water permit application received.
February 2022	EGLE acceptance of project design and final project plan.
March 2022	Bid project, receive bids, finalize loan closing.
Quarter 3,4 2022	Project construction begins.
Quarter 3,4 2022	Verification and Identification of Service Materials
Quarter 2,3,4 2023	Installation of New Water Services as Needed

F. COST ESTIMATE

The proposed project has been estimated to total $4,900,000. The following table shows the breakdown of costs:

Category	Estimated Cost
Division A – Identification/Verification of Service Materials	$750,000
Division B – Replacement of Water Services	$3,000,000
Preparation of DWRF Project Plan	$40,000
Design Engineering	$150,000
Construction Administration, Staking, and Inspection	$450,000
Material Testing	$25,000
Legal/Admin/Bonding	$85,000
Contingencies	$400,000
Total Preliminary Estimate of Cost	$4,900,000

Table 8 - Preliminary Estimate of Cost

G. USER COSTS

The existing number of REU's on the system is 3,589. These REU's are derived from the number of taps that are installed throughout the system. After the proposed project has been installed, user rates are anticipated to increase between $8.00 and $20.62 per quarter per REU based on principal forgiveness of all water service replacements or a worst-case scenario of no principal forgiveness, respectively. These costs will be in addition to normal rates that a typical user currently pays.

H. DISADVANTAGED COMMUNITY

Discussions with EGLE staff have determined that the City of St. Louis qualifies as a disadvantaged community. The disadvantaged status qualifies the City for up to $3,000,000 in principal forgiveness on the removal and replacement of lead services. The completed disadvantaged community status determination worksheet is included in Appendix D.

I. ABILITY TO IMPLEMENT THE SELECTED ALTERNATIVE

The City of St. Louis owns and operates the existing water distribution system. The institutional arrangements for financing the proposed project will be handled by the City accounting staff. The financing for the proposed project will be provided through the Drinking Water Revolving Fund and no other contributions from other entities will be provided.

V. ENVIRONMENTAL EVALUATION

A. HISTORICAL/ARCHAEOLOGICAL/TRIBAL RESOURCES

The proposed project will not affect any existing historical, archaeological, or tribal resources. All proposed work is removing and replacing existing infrastructure that is in developed areas. Tribal Historical Preservation Officers and review by SHPO will be conducted by EGLE staff and therefore will not be included in the project plan.

B. WATER QUALITY

The proposed project will not affect surface water or ground water quality of quantity since the project is replacing existing infrastructure. Drinking water is purchased through GAWA and purchased volumes are not expected to change. The water quality standards that will be achieved through the proposed project will be consistent with the new regulations through the Lead and Copper Rule mandate.

C. LAND/WATER INTERFACE

The proposed project will not have impacts on local wetlands, floodplains, rivers/streams, or coastal zones. Throughout construction soil erosion and sedimentation control measures will be installed to prohibit construction debris and runoff from affecting any environmentally sensitive areas. It is anticipated that any large excavations during water service replacement will be cleaned up and protected at the end of each construction day.

D. ENDANGERED SPECIES

The proposed project will not affect any threatened or endangered species or state special concern species of flora or fauna. A MNFI study will be conducted by EGLE staff to verify this statement. All proposed work will be removing and replacing existing infrastructure and therefore, will not disrupt any habitats.

E. AGRICULTRUAL LAND

No agricultural land will be affected by the proposed project.

F. SOCIAL/ECONOMIC IMPACT

The social/economic impact of the proposed project will be increased water rates to the community as well as increased health benefits to the community. After the proposed project has been installed, user rates are anticipated to increase between $8.00 and $20.62 per quarter per REU based on principal forgiveness of all water service replacements or a wort case scenario of no principal forgiveness, respectively. These costs will be in addition to normal rates that a typical user currently pays. This rate increase may provide hardships to some rate payers. At this time, there are no mechanisms in place that would alleviate added water costs to low or fixed-income users. After the project has been completed there will be an added level of comfort to the community knowing all users will have the highest quality drinking water with the lowest possibility of contaminants. By removing all lead and galvanized services previously connected to lead, the City residents will not suffer long term negative side-effects that are found in communities with lead services. At the end of the project, the City will continue to uphold its commitment to provide reliable and safe drinking water to the residents of the community.

G. CONSTRUCTION/OPERATIONAL IMPACT

The proposed project is broken down into two distinct divisions: water service identification and verification and water service replacement.

The first phase of the project will include water service identification and verification which will utilize hydro excavating services to identify the material components to 1,000 services that are constructed of unknown materials. Due to the proposed work being City wide, it is anticipated that a variety of site conditions will be encountered. By using hydro excavation, each site throughout the City will have minimal disturbance around the curb stop. Each service will have an excavation that is approximately 10-inches wide and 36 inches in length. After verification of the service material, the site will be documented, and the excavation will be filled with new soil and permanently seeded. Sporadic vegetation is found throughout the project locations; however, no trees are planned to be removed during construction.

The second phase of the proposed work will be replacing lead and or galvanized services with copper materials. Each home or business owner will be notified through a door flyer, official letter, or phone call to provide information related to the proposed work and to gain authorization for home/business entry. The work will then be scheduled after authorization has been obtained from the home/business owner. During this phase, there will be excavations at the water main, curb box, and at the home to allow for installation of the new water service. During this work, it is anticipated that homeowner's landscaping may be affected and will be replaced pending contractor selected construction methods. It is likely that the selected contractor will utilize horizontal directional drilling techniques to install the new water services. A small excavation will be required at the water main to connect the new services, then the service will be directionally drilled up to the house where it will enter the structure through the existing location. An excavation will be found at the existing curb stop for reconnections to the new service and abandonment of the old service. The home or business owner will be notified that they will be without service for approximately 4-8 hours throughout the workday. During this time, the work will be completed, and the new water service will be installed. Throughout both divisions, no trees or significant vegetation will be disturbed.

Additional construction impacts will be traffic control throughout the community as construction is taking place. It is anticipated that during excavation and replacement of lead and galvanized services that excavation affect local streets and may require road closures and temporary disturbances to homeowner's driveways. It is difficult to understand the overall scope of traffic regulation for the water service replacement at this stage of the project planning. It is likely that each water service will require temporary traffic control while the work is being performed. Pending location of the water main and services, it is likely that each service that is replaced will take approximately one workday to complete with traffic being regulated during working hours.

The final construction impacts that have potential to impact the work is the environmental contamination sites that were identified in the environmental evaluation. Special attention will be made to the identified environmentally sensitive areas through the design and construction of the proposed work. If chemical laden soils are found during construction a chemical abatement company will be notified, and corrective actions taken. It is possible that the soils will need to be disposed of in an environmentally sound manner. There is always a potential for chemical laden soils to be identified when working within developed corridors, however, it is uncommon to encounter a situation that warrants chemical abatement and it not anticipated for this project.

H. INDIRECT IMPACTS

Due to the nature of the proposed project, there are few, if any, indirect impacts anticipated after the proposed work is constructed. Since construction will be mostly limited to residential areas, temporary traffic control will be limited and easily detoured throughout the community. It is not anticipated that any significant changes in air or water quality will stem from construction. Additionally, there will be no changes in the rate, density, type of development, land use, natural areas, aesthetic aspects, or resource consumption over the useful life of the project.

VI. MITIGATION MEASURES

As discussed previously in the project plan, it is anticipated that traffic control and soil erosion and sedimentation controls will be needed throughout construction of the project. These construction impacts will be mitigated by obtaining general right-of-way permits for the installation of all water services as well as a soil erosion and sedimentation control permit.

VII. PUBLIC PARTICIPATION (*SECTION TO BE UPDATED AFTER PUBLIC HEARING ON JUNE 15*)

A. PUBLIC MEETING

The proposed project has been discussed at the February 23, 2021 special City Commission meeting where the Project Plan development was awarded to Spicer Group, Inc.

B. FORMAL PUBLIC HEARING AND/OR RECORDING

The City of St. Louis held a formal public hearing to inform the public of the Project Plan and to gain input from the public. The meeting was held at 6:00 PM on June 15, 2021 at the City Offices located at 300 N Mill St, St. Louis, MI 48880.

C. PUBLIC HEARING ADVERTISEMENT

A notice for the public hearing was advertised in the local newspaper 30 days prior to the hearing. A copy of the postings and affidavits confirming its publication are provided in Appendix E. A copy of the draft Project Plan was available at the City Offices 30 days prior to the meeting.

D. PUBLIC HEARING TRANSCRIPT OR RECORDING

The City hired a court stenographer to record the meeting minutes for the public hearing. A copy of the verbatim transcript can be found in Appendix E.

E. PUBLIC HEARING CONTENTS

A presentation was prepared for the public hearing. A few residents were in attendance for the public hearing and the attendance sheet in provided in Appendix E.

F. COMMENTS RECEIVED AND ANSWERED

There were no comments discussed at the public hearing. A copy of the verbatim transcript can be found in Appendix E.

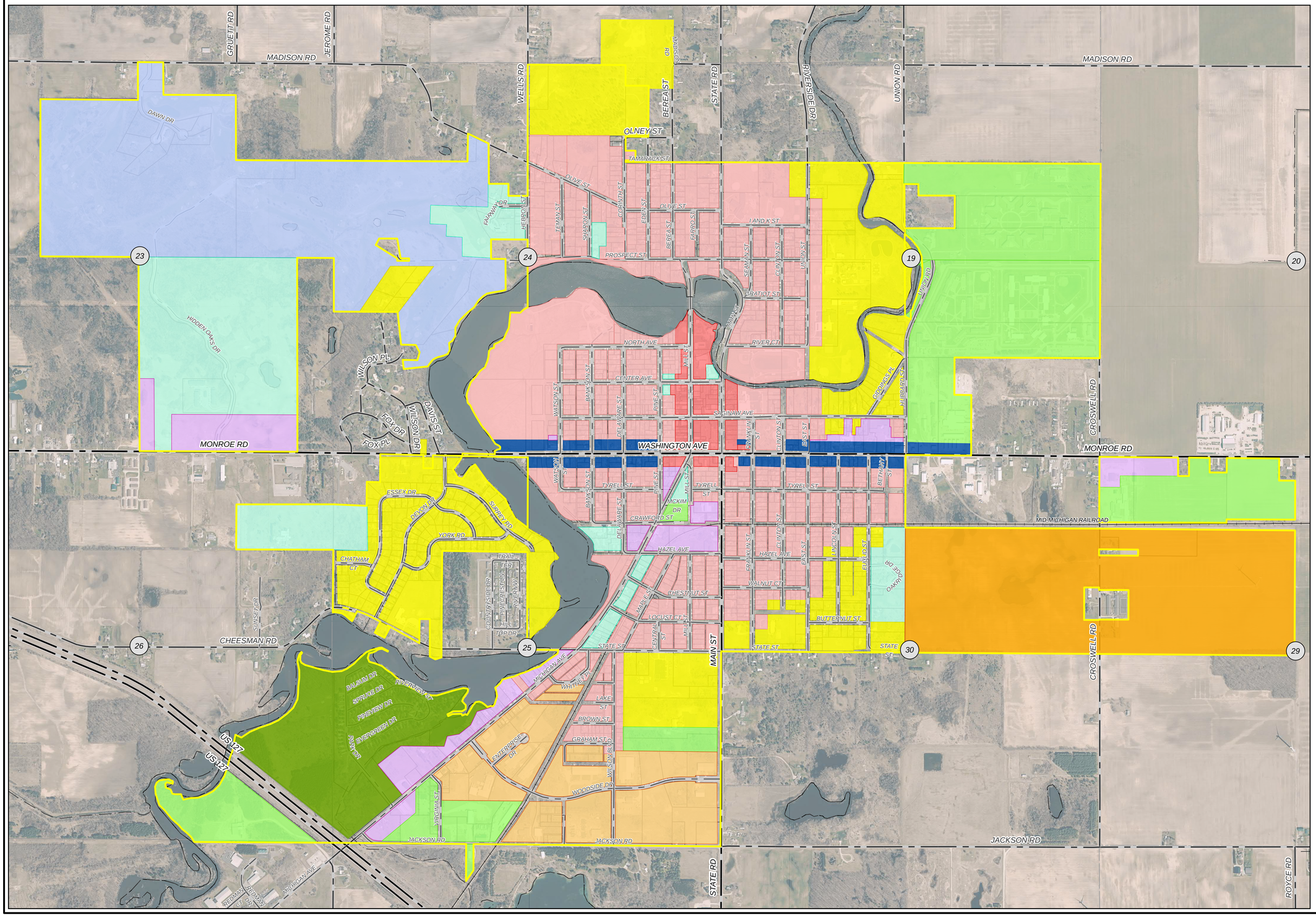
G. ADOPTION OF THE PROJECT PLAN

The City of St. Louis formally adopted this Project Plan on June 15, 2021. The resolution is included in Appendix E.

APPENDIX A

GENERAL SUPPORTING INFORMATION AND MAPS

APPENDIX A-1: ZONING MAP
CITY OF ST. LOUIS



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LEGEND

- R-1
- R-2
- R-3
- R-4
- C-1
- C-2
- I-1
- I-2
- PUD
- TRANSITIONAL
- I-3
- CITY LIMITS

BY	MARK	REVISIONS	DATE

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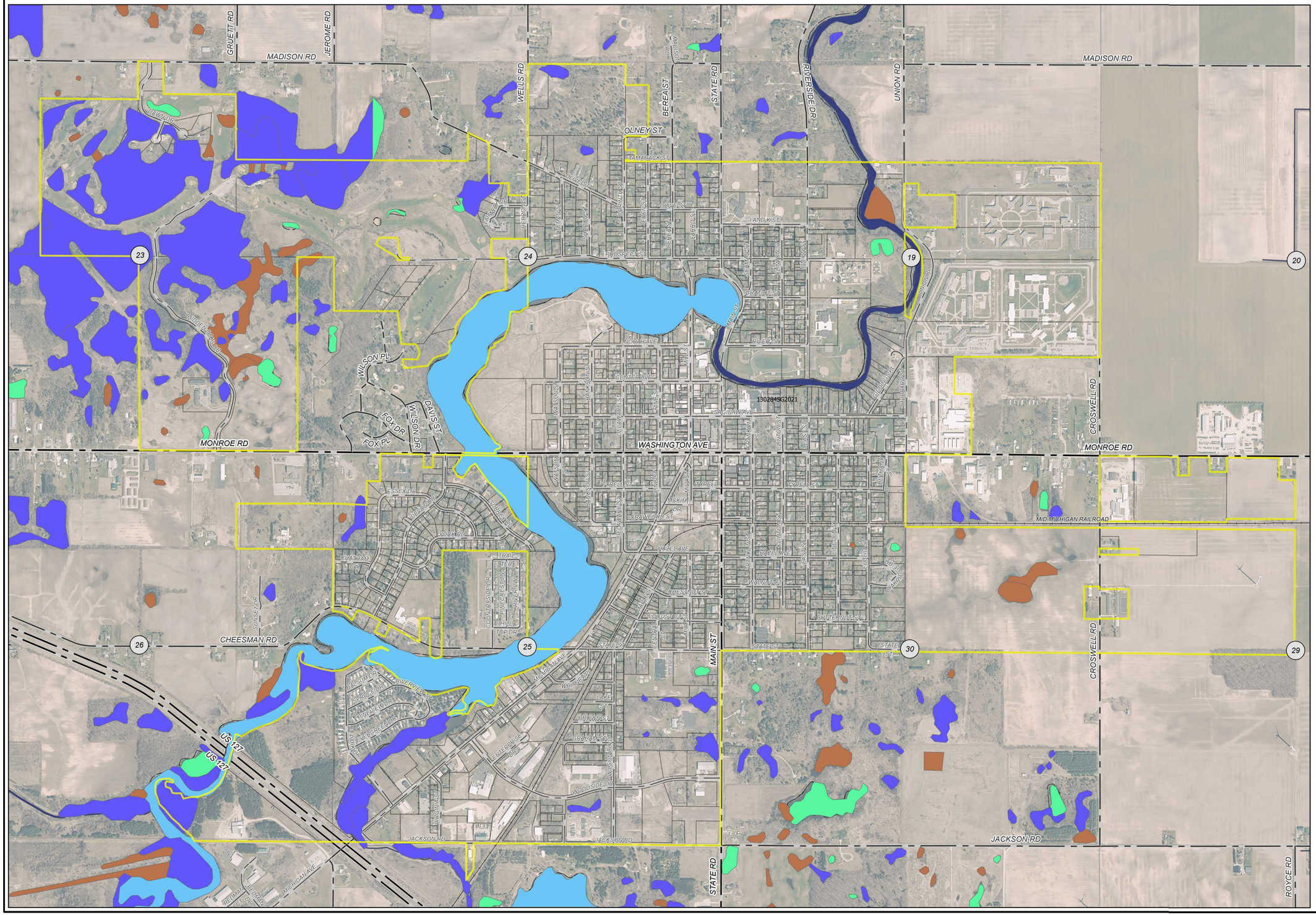
CITY OF ST. LOUIS
GRATIOT COUNTY, MICHIGAN

ZONING MAP

SAGINAW'S OFFICE
230 S Washington Ave
Saginaw, MI 48607
Tel. 989-754-4747
www.SpicerGroup.com

DE. BY: RTB	CH. BY: SJS	PROJECT NO.	
DR. BY: RTB	APP. BY: MMC	130284SG2021	
STDS.	SHEET 1 OF 1		A 1
DATE: APRIL 2021	FILE NO.		
SCALE: 1":600'	D - 4180		

APPENDIX A-2: WETLANDS
CITY OF ST. LOUIS



N

0 300 600 1,200 FEET

LEGEND

WETLAND TYPE

- FRESHWATER EMERGENT WETLAND
- FRESHWATER FORESTED/SHRUB WETLAND
- FRESHWATER POND
- LAKE
- OTHER
- RIVERINE
- WATERCOURSES
- STATE ROADS
- COUNTY ROADS
- LOCAL ROADS
- RAILROAD
- # SECTION
- CITY LIMITS

BY	MARK	REVISIONS	DATE

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CITY OF ST. LOUIS
GRATIOT COUNTY, MICHIGAN

WETLANDS MAP

Spicer group

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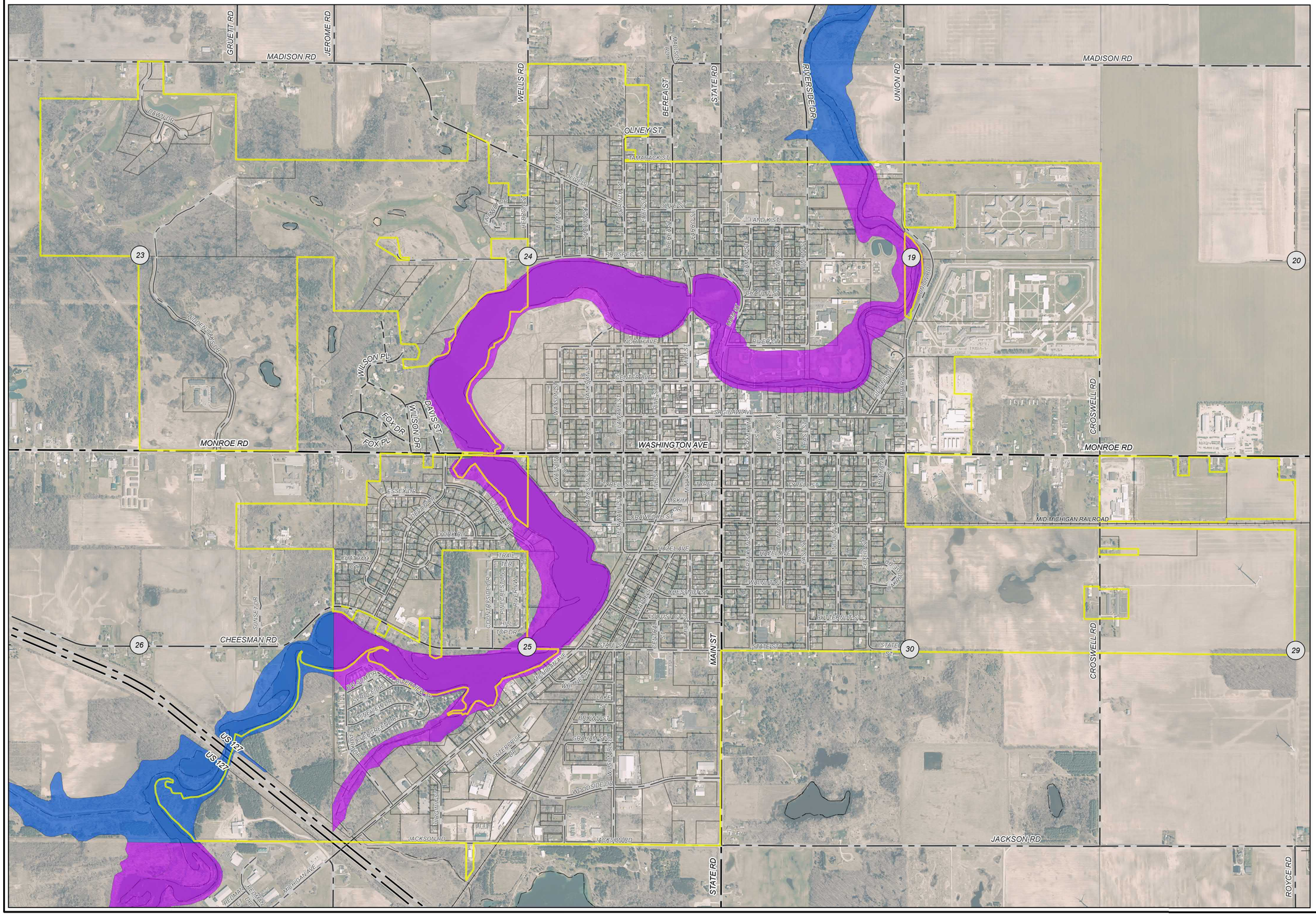
Tel. 989-754-4747
www.SpicerGroup.com

DE. BY: RTB	CH. BY: SJS	PROJECT NO.	
DR. BY: RTB	APP. BY: MMC	130284SG2021	
STDS.	SHEET 1 OF 1		A 2
DATE: APRIL 2021	FILE NO.		
SCALE: 1":600'	D-5767		

APPENDIX A-3: FEMA FLOOD ZONES
CITY OF ST. LOUIS



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0 300 600 1,200 FEET

LEGEND

- FEMA 100 YR FLOOD HAZARD ZONE A
- FEMA 100 YR FLOOD HAZARD ZONE AE
- WATERCOURSES
- STATE ROADS
- COUNTY ROADS
- LOCAL ROADS
- RAILROAD
- # SECTION
- PARCELS
- CITY LIMITS

BY	MARK	REVISIONS	DATE

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CITY OF ST. LOUIS
GRATIOT COUNTY, MICHIGAN

FEMA FLOOD ZONES

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230 S Washington Ave
Saginaw, MI 48607
Tel. 989-754-4747
www.SpicerGroup.com

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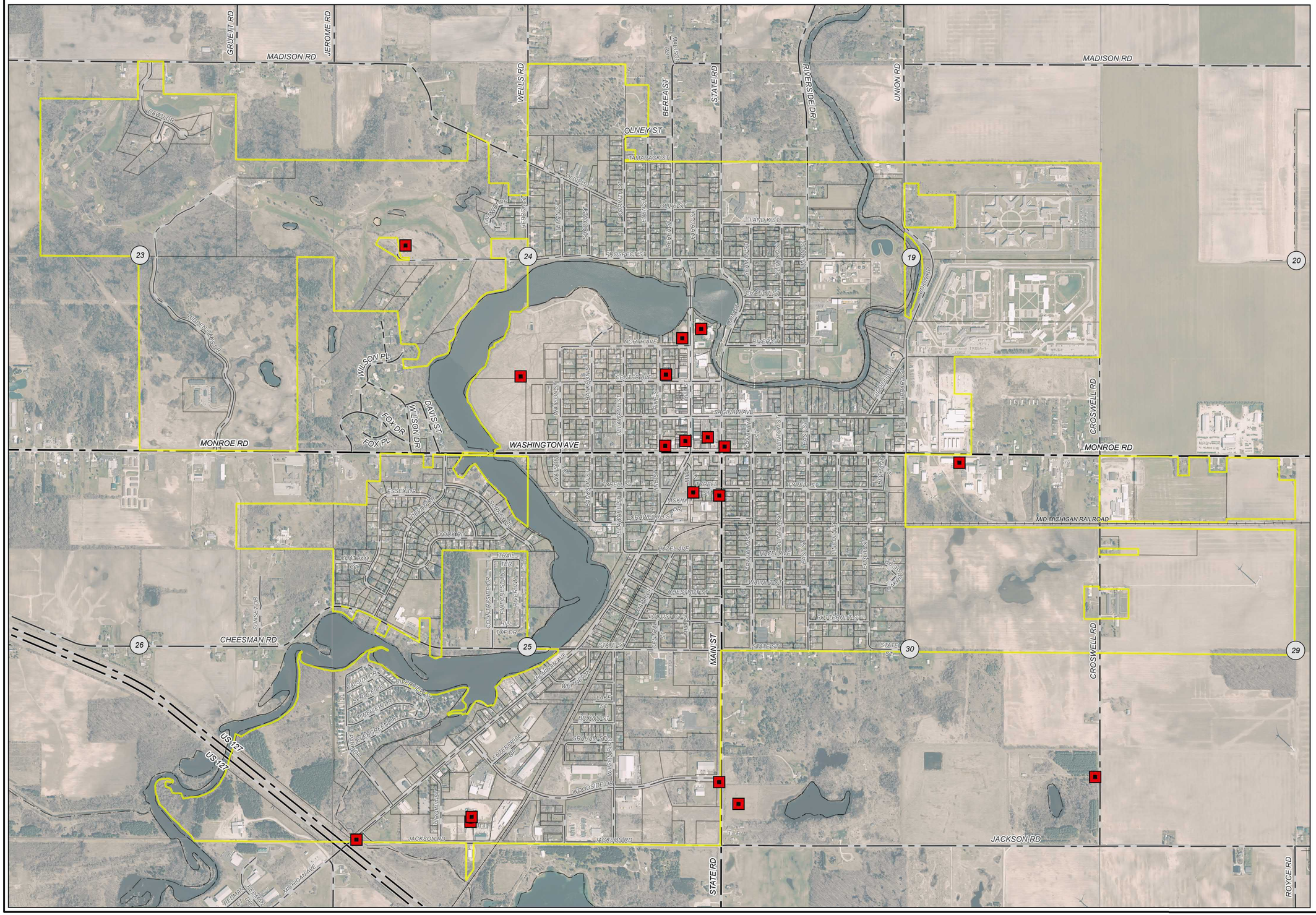
DR. BY: RTB	APP. BY: MMC	130284SG2021	
STDS.		SHEET 1 OF 1	A 3
DATE: APRIL 2021		FILE NO.	
SCALE. 1":600'		D - 5765	

APPENDIX A-4: PART 201 SITES OF ENVIRONMENTAL CONTAMINATION
CITY OF ST. LOUIS



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LEGEND

- SITES OF ENVIRONMENTAL CONTAMINATION PART 201
- CITY LIMITS
- WATERCOURSES
- STATE ROADS
- COUNTY ROADS
- LOCAL ROADS
- RAILROAD
- PARCELS

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CITY OF ST. LOUIS
GRATIOT COUNTY, MICHIGAN

SITES OF ENVIRONMENTAL CONTAMINATION

Spicer group
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230 S Washington Ave
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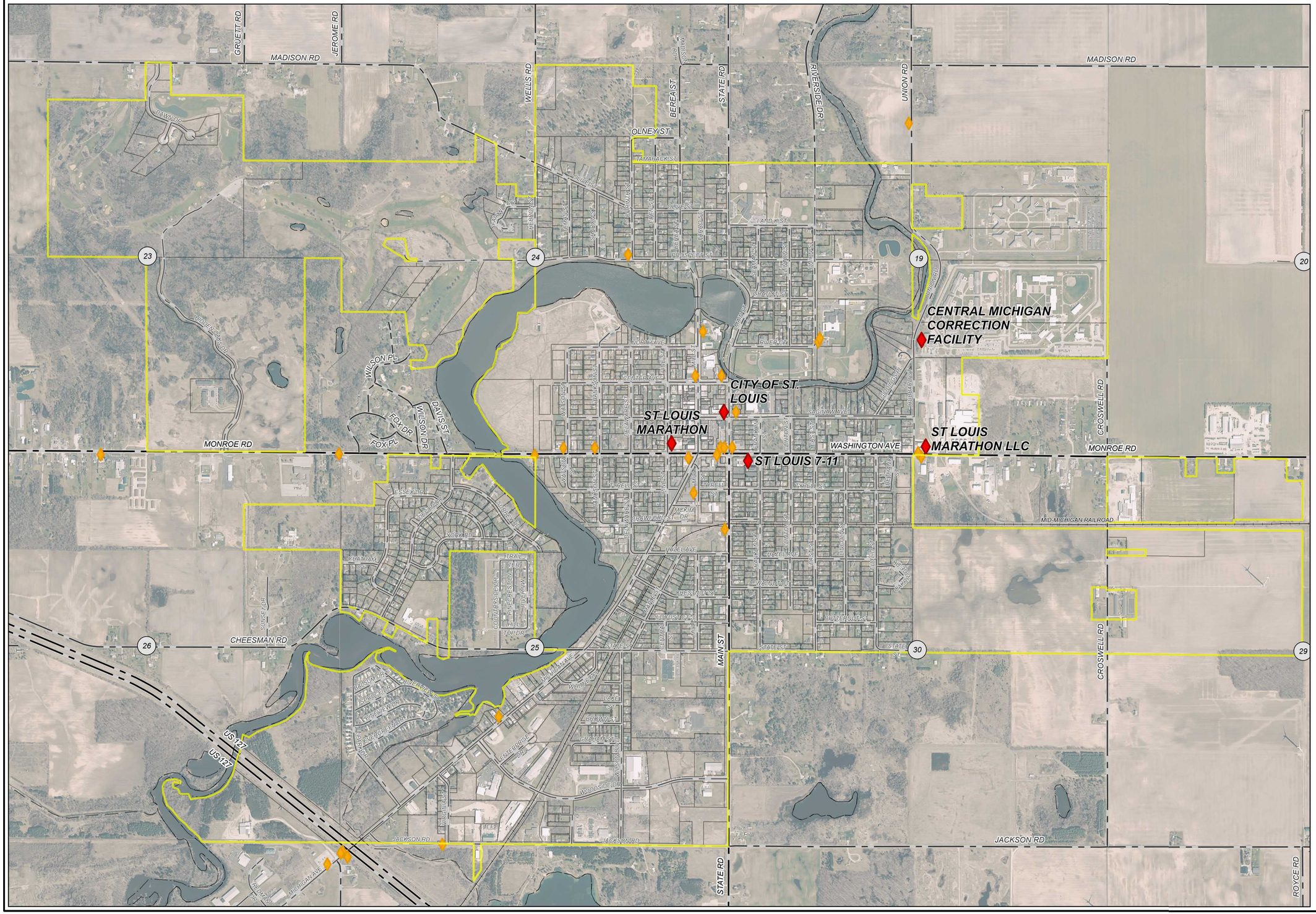
www.SpicerGroup.com

DE. BY: RTB	CH. BY: SJS	PROJECT NO.	
DR. BY: RTB	APP. BY: MMC	130284SG2021	
STDS.	SHEET 1 OF 1		A 4
DATE: APRIL 2021	FILE NO.		
SCALE: 1":600'	D-5766		

APPENDIX A-5: PART 211 UNDERGROUND STORAGE TANKS
CITY OF ST. LOUIS



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0 300 600 1,200 FEET

LEGEND

- UNDERGROUND STORAGE TANKS PART 211 ACTIVE
- UNDERGROUND STORAGE TANKS PART 211 CLOSED
- CITY LIMITS
- WATERCOURSES
- WATERCOURSES

ROADS

- STATE ROADS
- COUNTY ROADS
- LOCAL ROADS
- RAILROAD
- SECTION
- (#) SECTION
- PARCELS

BY	MARK	REVISIONS	DATE

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CITY OF ST. LOUIS
GRATIOT COUNTY, MICHIGAN

UNDERGROUND STORAGE TANKS

Spicer group

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Saginaw, MI. 48607
Tel. 989-754-4747
www.SpicerGroup.com

DE. BY: RTB	CH. BY: SJS	PROJECT NO.	
DR. BY: RTB	APP. BY: MMC	130284SG2021	
STDS.		SHEET 1 OF 1	A 5
DATE: APRIL 2021		FILE NO.	
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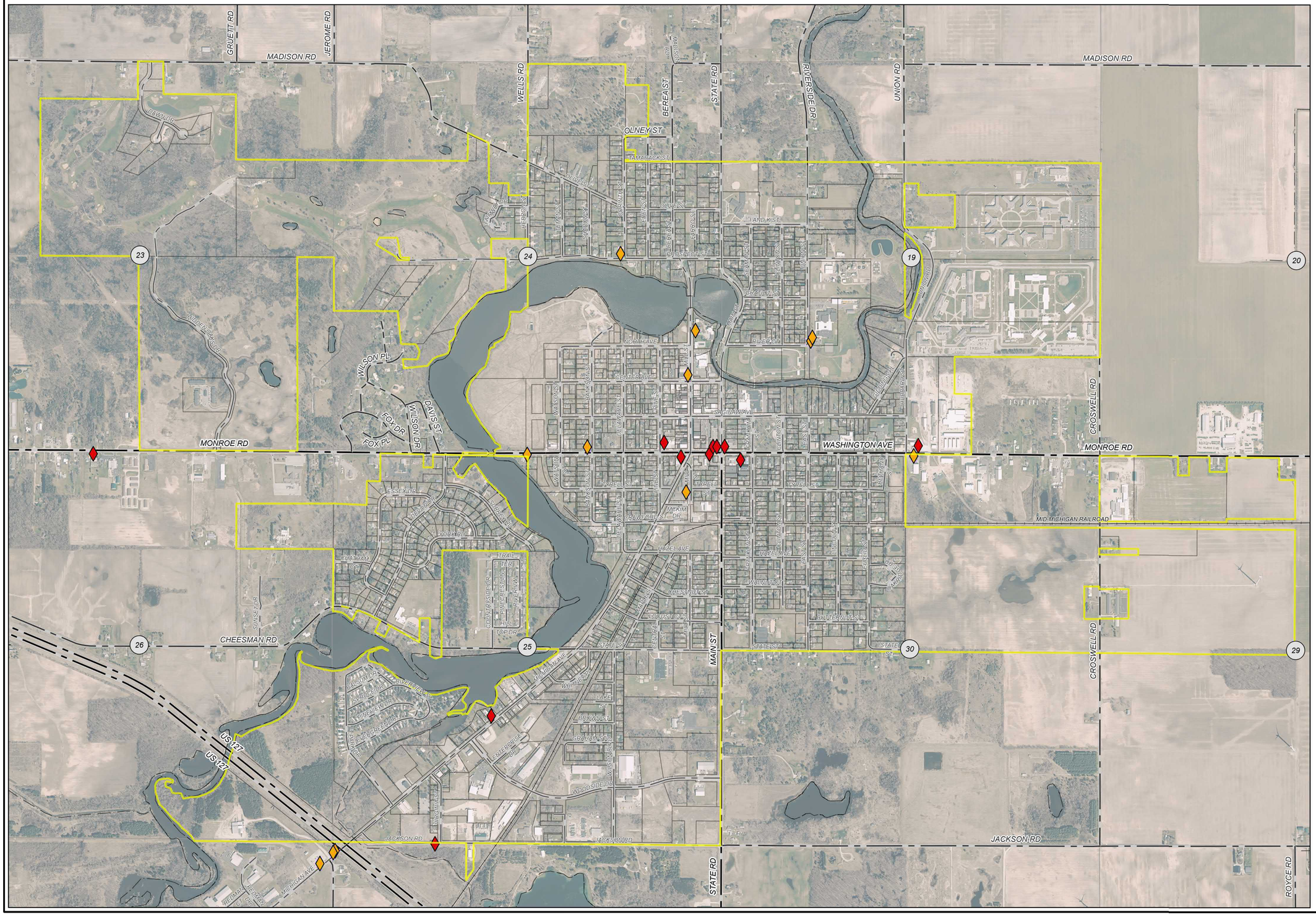
APPENDIX A-6: PART 213 LEAKING UNDERGROUND STORAGE TANKS
CITY OF ST. LOUIS



LEGEND

- LEAKING UNDERGROUND STORAGE TANKS PART 213 OPEN
- LEAKING UNDERGROUND STORAGE TANKS PART 213 CLOSED
- WATERCOURSES
- STATE ROADS
- COUNTY ROADS
- LOCAL ROADS
- RAILROAD
- # SECTION
- PARCELS
- CITY LIMITS

BY	MARK	REVISIONS	DATE

CITY OF ST. LOUIS
GRATIOT COUNTY, MICHIGAN

LEAKING UNDERGROUND STORAGE TANKS

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www.SpicerGroup.com

DE. BY: RTB	CH. BY: SJS	PROJECT NO.	
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STDS.		SHEET 1 OF 1	A 6
DATE: APRIL 2021		FILE NO.	
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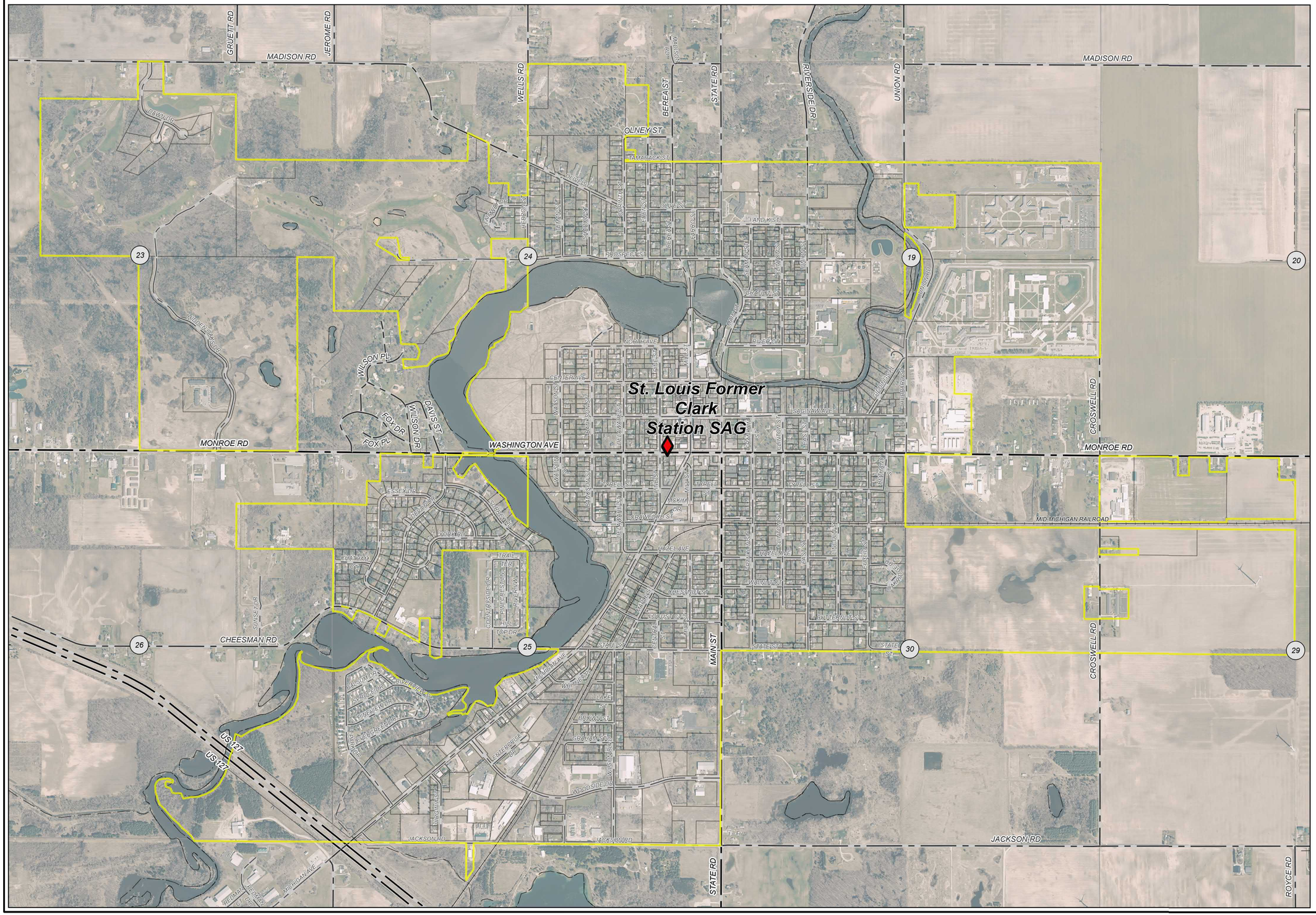
APPENDIX A-7: BROWNFIELD REDEVELOPMENT SITE
CITY OF ST. LOUIS



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0 300 600 1,200 FEET

LEGEND

- BROWNFIELD GRANT
- WATERCOURSES
- STATE ROADS
- COUNTY ROADS
- LOCAL ROADS
- RAILROAD
- PARCELS
- CITY LIMITS

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CITY OF ST. LOUIS
GRATIOT COUNTY, MICHIGAN

BROWNFIELD REDEVELOPMENT

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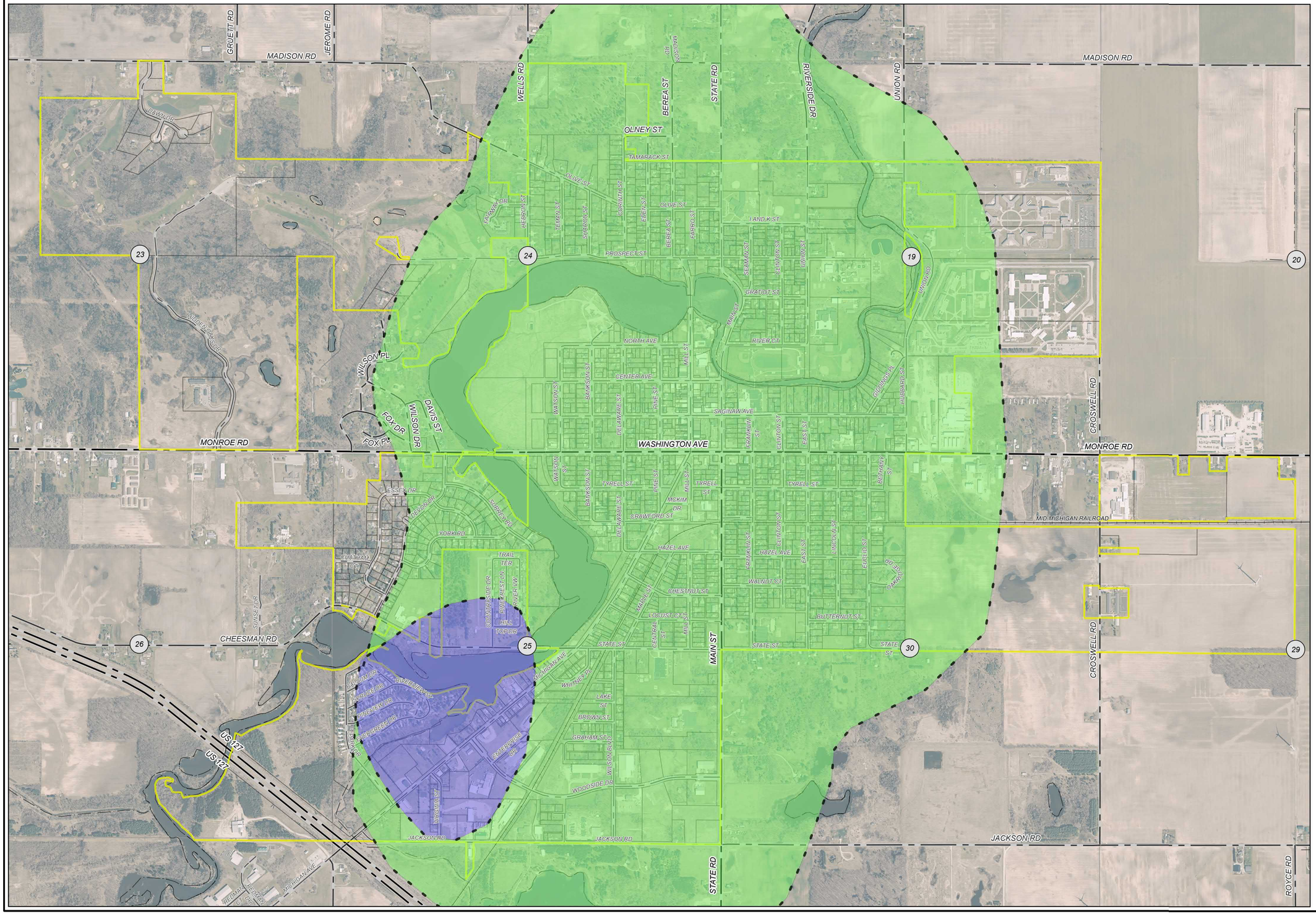
STDS.	SHEET 1 OF 1		A
DATE: APRIL 2021	FILE NO.		7
SCALE: 1":600'	D-5768		

APPENDIX A-8: WELLHEAD PROTECTION AREAS
CITY OF ST. LOUIS



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0 300 600 1,200 FEET

LEGEND

WELLHEAD PROTECTION AREAS

- LOW VULNERABILITY WELLHEAD AREA
- TRADITIONAL WELLHEAD PROTECTION AREA DELINEATION
- TYPE 1 PROVISIONAL WELLHEAD PROTECTION AREA
- TYPE 2 PROVISIONAL WELLHEAD PROTECTION AREA
- CITY LIMITS
- WATERCOURSES
- STATE ROADS
- COUNTY ROADS
- LOCAL ROADS
- RAILROAD
- PARCELS

BY	MARK	REVISIONS	DATE

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CITY OF ST. LOUIS
GRATIOT COUNTY, MICHIGAN

WELLHEAD PROTECTION AREAS

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STDS.		SHEET 1 OF 1	A
DATE: APRIL 2021		FILE NO.	8
SCALE: 1" 600'		D-5769	

APPENDIX B

WATER ASSET MANAGEMENT PLAN AND WATER RELIABILITY STUDY

City of St. Louis
Water Asset Management Program
WSSN 6320

Project No. 171394
December 28, 2017

Fishbeck, Thompson, Carr & Huber, Inc.
engineers | scientists | architects | constructors

ftc&h

City of Saint Louis
Water Asset Management Program
WSSN 6320

Prepared For:
City of Saint Louis
Saint Louis, Michigan

December 28, 2017
Project No. G171394

1515 Arboretum Drive, SE
Grand Rapids, Michigan 49546
616.575.3824
www.ftch.com
Fishbeck, Thompson, Carr & Huber, Inc.
engineers I scientists I architects I constructors

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List of Abbreviations/Acronyms

AMP	Asset Management Plan
AWWA	American Waterworks Association
BRE	Business Risk Exposure
CIP	Capital Improvements Plan
COF	Consequence of Failure
FTCH	Fishbeck, Thompson, Carr & Huber, Inc.
GIS	Geographic Information System
HDPE	High-Density Polyethylene
HVAC	Heating, Ventilating, Air and Cooling
LOS	Level of Service
MDEQ	Michigan Department of Environmental Quality
MG	Million Gallons
MGD	Million Gallons per Day
POF	Probability of Failure
PRV	Pressure Reducing Values
PSI	Pounds per Square Inch
PVC	Polyvinyl Chloride
REU	Residential Equivalent Unit

1.0 Executive Summary

The Cities of Alma and St. Louis form the Gratiot Area Water Authority (GAWA). The City of Saint Louis (City) water system receives water from GAWA. The water received from GAWA is distributed to approximately 7,060 people in the City. The City water system is comprised of both water storage and distribution infrastructure. The City's water system assets are managed by the Water Department, which is part of the Public Works Unit. The Water Department and system administrators work collaboratively to develop, implement and maintain an asset management program that strives to maintain an established level of service to its customers. The City's mission is to provide safe, reliable, and affordable water service to their customers, as detailed in the City's level of service goals.

This report summarizes the comprehensive Water Asset Management Program (AMP) the City has in place to meet the Michigan Department of Environmental Quality (MDEQ) asset management and capital improvements plan requirements for community water supplies as defined in the Michigan Drinking Water Act, Part 399, R 325.10102. The framework of the City's AMP is comprised of five core components: asset inventory, criticality analysis, level of service (LOS), capital improvements plan (CIP), and revenue structure.

The City maintains an existing inventory of horizontal assets in a hydraulic model database while a separate inventory of vertical assets in an Excel database was developed as part of the AMP. The inventories include information on all water system assets, including description, location, age, condition, expected remaining life and replacement cost. Asset condition assessments were completed using existing information maintained in the databases and observations of vertical assets based on site visits completed by FTCH. The inventory data was evaluated to determine which assets are most critical through calculation of the probability of failure (POF), consequence of failure (COF) and Business Risk Exposure (BRE). The asset inventory and criticality components are critical steps in identifying deficiencies within the water system's infrastructure to help recognize where replacement and rehabilitation projects are needed.

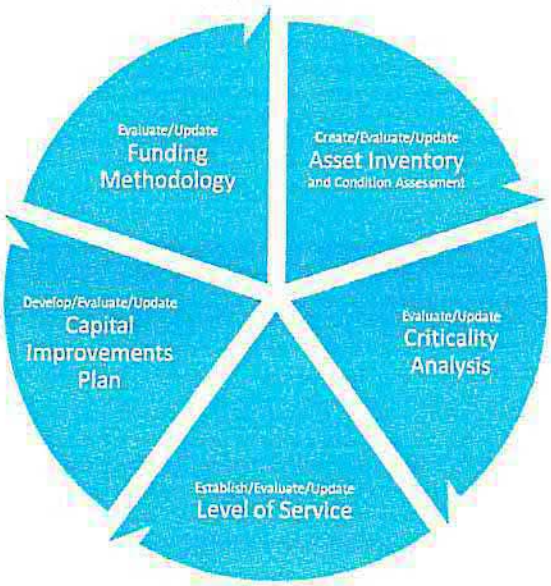
Using the principles of asset criticality analysis, and various efforts such as water system studies and master plans, project needs are regularly reviewed and updated based on identified water system needs . Projects are ranked based on several evaluation criteria and weighting factors for entry into the City's water system CIP. Some of these factors include safety, regulatory compliance, coordination with other projects, operations and maintenance costs, asset reliability and consequences of asset failure and level of service. An annual CIP is prepared and submitted to the City Council for their approval.

The level of service criteria for the City water system is one of the core AMP components. This report includes the City's established LOS, consolidating key performance targets that the water system strives to provide. Consideration is given to the selected LOS when the City makes decisions on projects, performance targets and water rates to customers.

The City's funding structure and rate methodology is described in the report, City of Saint Louis, MI, Water Asset Management Plan Financial Analysis, December 2017 by Municipal Analytics, LLC; a summary of this report is included in Appendix 3. A full version of this report will be sent at a later time.

2.0 Introduction

This report was completed as part of an overall AMP that was developed for the City. In 2017, the City retained Fishbeck, Thompson, Carr & Huber, Inc. (FTCH) to complete an AMP for the City's water system in response to the MDEQ requirement that systems supplying water to over 1,000 people must implement a water AMP by January 1, 2018.



An AMP is a program that identifies the desired level of service at the lowest life cycle cost for rehabilitating, repairing, or replacing the assets associated with the waterworks system. It's an important tool for maintaining a water system's current and future effectiveness. As part of an AMP, water system administrators inventory and plan replacement of water system assets so they can continue to provide safe water reliably to their customers. The AMP also helps set water rates to ensure that funding is available to replace water system assets as they reach the end of their useful life. In short, an AMP allows a water system to provide cost-effective service to their water system customers, now and into the future.

There are five core components to an AMP:

1. Asset Inventory.
2. Criticality Analysis.
3. Level of Service (LOS).
4. Capital Improvement Planning.
5. Funding Structure and Rate Methodology.

The asset inventory is a detailed list of all water system assets, including asset description, location, age, condition, estimated remaining life and replacement cost. The results of condition assessments are updated in the asset inventory as they are conducted. Further description of the City's asset inventories and how they are managed is included in Section 4.0.

The criticality analysis involves ranking the water system assets that are most critical to the system and consists of two parts: the probability of failure (POF) and the consequence of failure (COF). Generally, a numerical value is assigned to each of these two parts, and the two numerical values are multiplied together, with the resulting number representing the overall "criticality", or Business Risk Exposure (BRE), of the asset. The POF score is based on several parameters, but the condition of the asset, as assessed during the Asset Inventory component, is the most important; assets that are in poor condition are generally assigned a higher POF. The COF relates to the impact the failure of a given asset would have on other equipment or processes, public health, the environment, property damage and lost revenue. A higher score is given to assets whose failure would have a greater impact. How the City assigns criticality and uses this information to identify projects is described in Section 5.0.

Level of service (LOS) defines the standards by which the City will judge the water system performance over the long term and sets operational standards that the water system is attempting to achieve on its customer's behalf. LOS is established by defining concrete, achievable and trackable goals to be used as a tool to help guide customer expectations about cost of service as well as water system operational and management strategies. The establishment of the City's LOS and how it fits in the City's AMP is described in Section 6.0.

A Capital Improvements Plan (CIP) identifies water system replacement and rehabilitation needs for 5-year and 20-year planning periods. CIP projects are identified for replacement, rehabilitation or improvement using the results of the asset inventory, condition assessment and criticality analysis. The CIP is then subject to a formal approval process by the water system's leadership. It is understood that the expected costs and timelines for individual projects may fluctuate based on changing needs in the water system. Further detail on the City's CIP is discussed in Section 7.0.

The rate funding structure and funding methodology portion of the AMP is intended to demonstrate how the City will position itself financially to implement the CIP. The rate methodology is how the City ensures rates and charges are adequate to provide sufficient revenue to fund operation, maintenance, capital improvement projects, debt costs and other financial policies. The rate structure and funding methodology is described in the Municipal Analytics report.

An AMP report is not a static document intended to plan for all the water system's current and future needs. It is intended to be a "working document" requiring periodic updates and adjustments to maintain a good plan for keeping the City's water system safe, operating well, and cost effective for its customers.

3.0 Water System Overview

The City of Saint Louis (City) has a contract with GAWA to receive softened groundwater. Prior to 2012, the cities of Alma and Saint Louis each owned and operated independent water systems. The Saint Louis system was a groundwater supply system with 3.56 mgd total rated capacity, and an elevated water storage tank. A plume of contaminated groundwater was discovered to have impacted two of the Saint Louis wells, resulting in the need for an alternate water supply. An agreement was reached between the cities that Saint Louis would replace their water supply wells near the Alma water plant and Alma would supply Saint Louis with softened water from their system, allowing Saint Louis to abandon their existing well system. This was the basis on which the Gratiot Area Water Authority (GAWA) was formed in 2012.

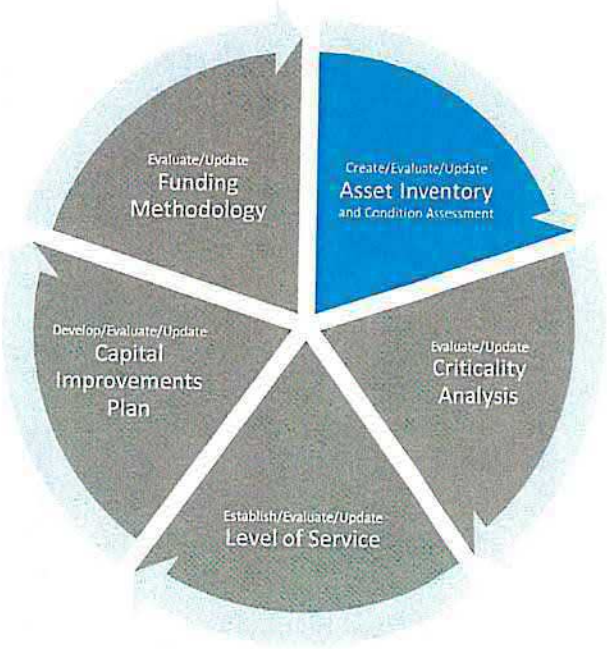
The City water system contains about 32.2 miles of water main. The water main size ranges from 2-inch to 16-inch. Cast iron is the most common water main material present in the system; the next most common is ductile iron. The system also includes smaller areas of asbestos cement and plastic piping. The City has room for improving existing water main throughout the system with roughly 65% of the system installed before 1980.

The City currently has an average daily water demand of 0.90 million gallons per day (MGD) with an estimated future demand of 0.94 MGD by 2037. Most of the recent growth in the City's water demands has been due to the addition of the correctional facilities to the northeast of the system. Since merging with Alma and forming the GAWA, the City's only responsibilities in the water system are the water mains and two elevated storage tanks. The City has a 0.50 million gallon (MG) elevated storage tank at West Crawford Street and a 0.20 MG elevated storage tank at Giddings Street.

This AMP is intended to cover the assets for the City of Saint Louis assets alone, and not the assets owned by GAWA.

4.0 Asset Inventory

An inventory of the assets within the City's water system was completed. This section includes a summary of the processes used to develop the inventory of assets for the City's water system. Generally, all assets with a value of $5,000 or more were included in the analysis, along with certain lower cost assets considered vital to the system.



Assets are grouped into two types: horizontal and vertical. Horizontal and vertical assets are managed by the Water Department and include assets such as water mains, valves, and hydrants used to distribute water to the system's customers and water storage facilities.

4.1 Horizontal Assets

The City maintains an inventory of water mains in a hydraulic model database of the water system. The City also has a General Plan map with an inventory of valves and hydrants in the system.

4.1.1 Water Mains

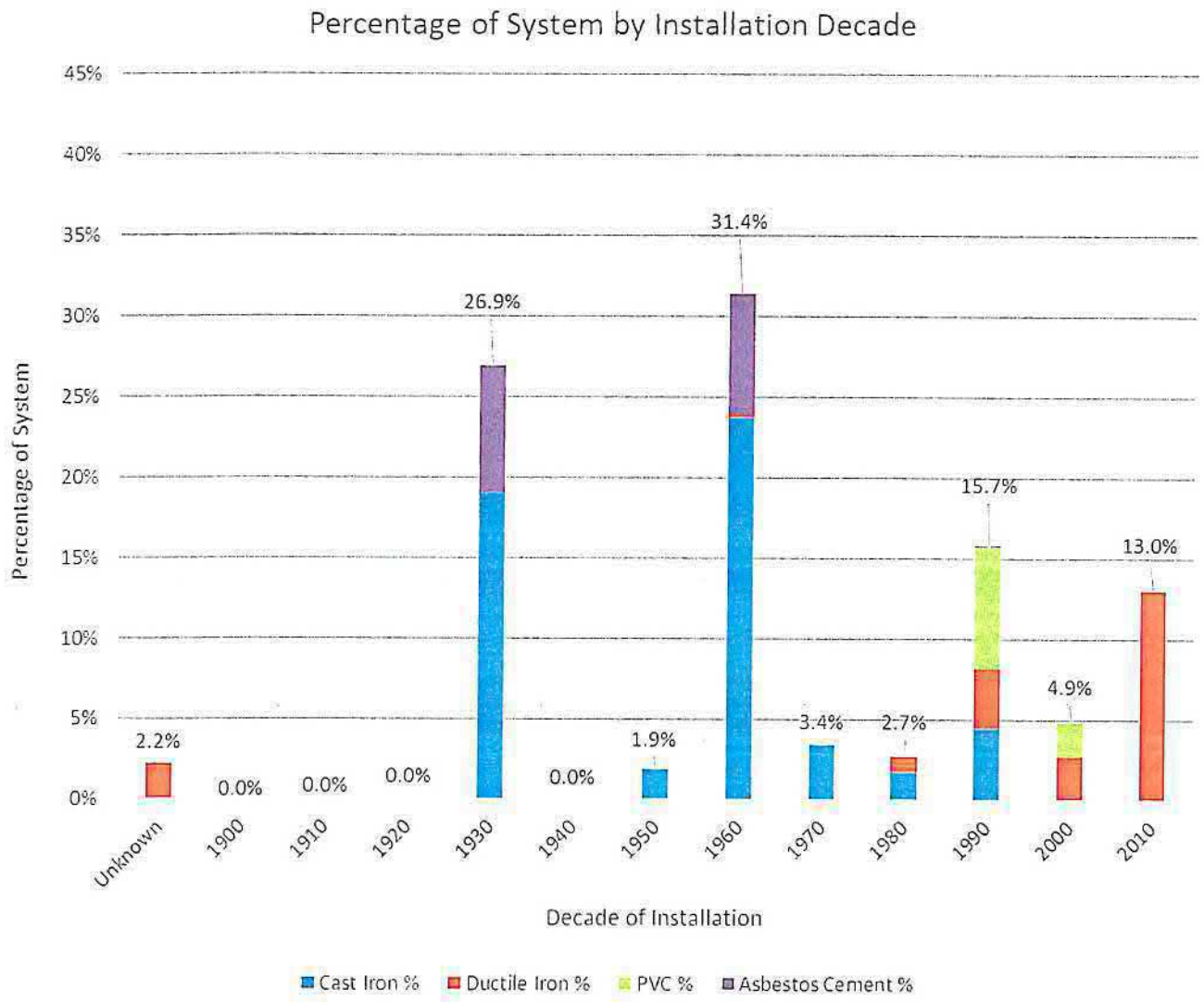
The City's water system contains more than 32 miles of water main. An inventory of the water mains is maintained in a hydraulic model database.

The following parameters are recorded in the GIS database:

- Identification Number
- Diameter
- Hazen Williams C-factor
- Length
- Installation Year
- Material

As part of the AMP, the condition of the water mains was assessed. While the condition could not be visually observed, the water main age in conjunction with the material and C-factor were considered to be good indicators of the condition of the mains.

The graph below presents a breakdown of the percentage of water mains in the system by the decade in which the mains were installed. It also includes information on the proportion of water mains installed by material.



The graph shows that cast iron is the most common material in the system. The majority of the cast iron was installed before the 1970s. Ductile iron is the second most common pipe material with the majority of installations occurring post-1980. These is also a significant amount of PVC and Asbestos Cement installed in the system.

To determine the expected useful life for each type of water main, the AWWA report "Buried No Longer" was used. In the report, the typical estimated service life of water main was investigated using utilities' experiences, extensive research, and professionals' experiences. A Long Service Life (LSL) and a Short Service Life (SSL) were estimated for different regions around the United States and for different sizes of systems. For the purposes of this report, the estimated service lives for the Midwestern region with a medium to small size system were used. The average of the LSL and the SSL was used as the expected useful life. The expected service life of a cast iron main was estimated at 100 years, the expected service life of a ductile iron main was estimated at 80 years, the

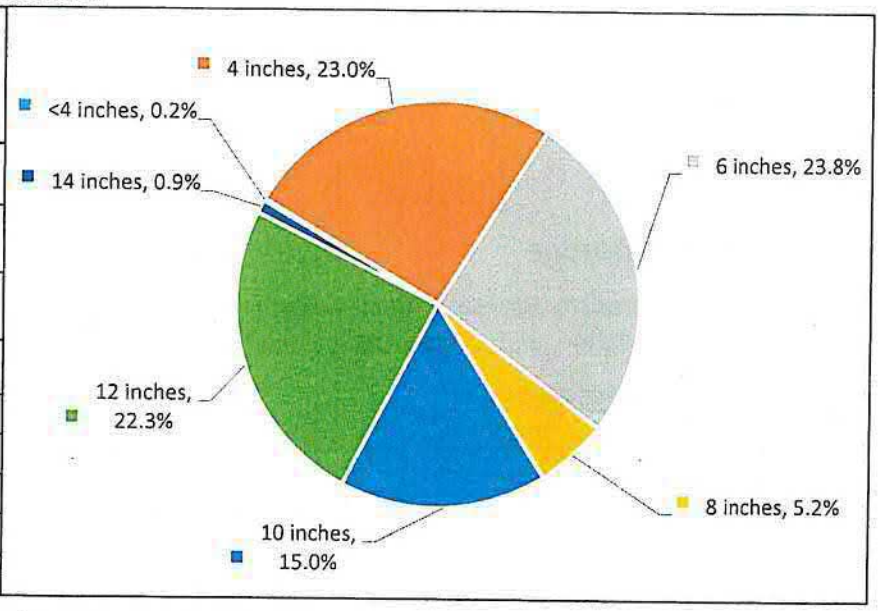
expected service life of an Asbestos Cement water main was estimated at 70 years, and the expected service life of a PVC water main was estimated at 55 years.

Based on the data from the model database, about 11.9% of the water mains in the system are currently beyond their useful life and 37.6% will reach the end of their useful life within the next 20 years. It should be noted that any main with an unknown installation year was assumed to be at the end of its useful life. It should also be noted that some pipe can remain in service beyond these theoretical expected service lives. Regardless, this criterion can be used as a good guide for the overall condition of pipe in the system, and for budgeting for future replacement.

The diameters of the water mains in the system range from 2-inches up to 16-inches. Table 4.1 shows the length and percentage of the system of water main by diameter.

Table 4.1 – Length of Main based on Diameter

Diameter	Length of Main (ft)	Percentage of Total
<4 inches	294	0.2%
4 inches	39,167	23.0%
6 inches	40,572	23.8%
8 inches	8,937	5.2%
10 inches	25,649	15.0%
12 inches	37,961	22.3%
14 inches	1,577	0.9%
16 inches	16,584	9.7%
Total	**170,448**	



Roughly 52% of the system is made up of 8-inch or smaller diameter mains. This is typical of similarly sized systems, where mains 12 inches and larger are used as transmission mains; smaller mains branch off the transmission mains to provide water to adjacent customer communities. The MDEQ recommends that the smallest main in a water system be 6 inches; the City needs to improve in this respect with more than 23% of the existing system made up of mains with a diameter of less than 6 inches.

4.1.2 Hydrants

The City's water system has 245 hydrants. An inventory of the hydrants in the system is maintained in the City's General Plan map. However, only the location of each hydrant is currently recorded. The hydrant number, size, and type will be determined by the City and inventoried in the future.

4.1.3 Valves

The City's water system has 634 valves. An inventory of the valves in the system is maintained in the City's General Plan map. However, only the location of each valve is currently recorded. The valve number, size, and type will be determined by the City and inventoried in the future.

4.1.4 Future Updates to Horizontal Asset Inventory

The City has created and maintains an inventory of horizontal assets including water mains in a hydraulic model database and an inventory of hydrants and valves in a General Plan map. The City will continue to maintain the existing inventories annually and record information for the hydrants and valves. It is recommended that the City develop a GIS database of their water system assets in the future.

4.2 Vertical Assets

Vertical assets within the City's water system include two water storage facilities. A tabulation and condition assessment of the City's vertical assets was completed as part of this report. As a rule of thumb, any asset worth more than $5,000 was assessed. Where applicable, some assets were assessed as one cohesive group.

For all vertical assets evaluated, the following parameters were recorded at a minimum:

- Asset Type
- Asset ID
- Asset Location
- Physical Condition
- Capacity/Size
- Cost
- Year Installed
- Expected Useful Life

4.2.1 Water Storage

The City owns two water storage tanks. These include two elevated storage tanks. The tank location, type, material, year of installation, and volume are listed in Table 4.2.

Table 4.2 – Water Storage Facilities

Tank Location	Tank Type	Tank Material	Year of Installation	Volume (MG)
West Crawford Street	Elevated	Steel	1963	0.5
Giddings Street	Elevated	Steel	2016	0.2

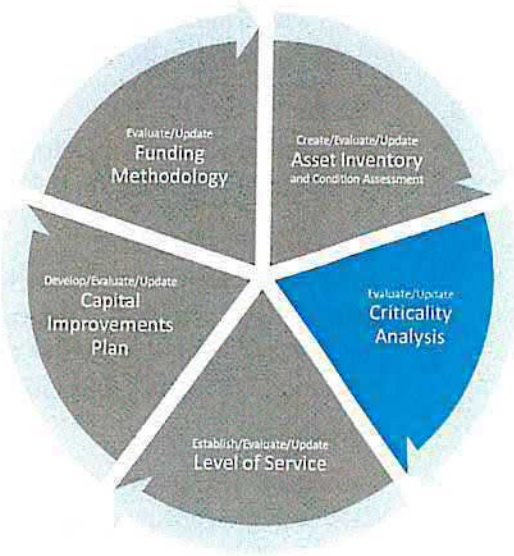
FTCH conducted a site visit to each water storage facility to conduct a visual assessment of current conditions. Tank inspection reports were also used for each tank to assess the condition of the tanks where they were available.

4.2.2 Future Updates to Vertical Asset Inventory

An inventory of the current vertical assets of the City water system was created as part of this report. The City will continue to update the inventory of vertical assets annually and record additional parameters for these assets where applicable. The City will continue to maintain and update their vertical asset inventory, using the inventory as a tool for water system planning.

5.0 Criticality Analysis

The criticality analysis component of the AMP utilizes information contained within the asset inventories to prioritize the replacement of assets based on a calculated criticality score. The criticality analysis provides the City with a tool to plan asset replacement/rehabilitation projects well into the future and set adequate funding structure and water rates to cover the corresponding investment. The purpose of this section is to summarize the methods used to determine the criticality of the City's water system assets.



5.1 Horizontal Assets

A criticality assessment of water mains throughout the water system was completed using information from the City's hydraulic model database. The criticality of hydrants and valves were assumed to be equal to their corresponding water mains.

5.1.1 Probability of Failure Metrics/Methods

The metrics used to determine the POF for individual water mains are listed below. Each metric was scored on a scale of 1 to 5 with 5 indicating the highest POF. The rubric used in determining the score for each metric used is shown in Table 5.1, while a description of each metric and the reasoning for using said metric is listed below.

1.) Remaining Useful Life

Water mains have different expected useful lives depending on their material. The Buried No Longer report completed by the American Water Works Association (AWWA) determined typical useful lives for water mains in the Midwest region. The age of each water main was subtracted from its expected useful life to determine the water main's remaining useful life. The score was then determined based on the remaining useful life ranges in Table 5.1.

2.) Hazen Williams C-factor

The hydraulic model of the City water system is calibrated every 5 years during the development of the City water system Reliability Study issued in 2017. The Hazen Williams C-factors are adjusted until pressures in the hydraulic model match pressure data obtained during hydrant flow tests. The C-factors correspond to the pipe's roughness, which often has a strong correlation with its condition. The score for C-factor is based on the calculated C-factor in the hydraulic model for the water main.

Table 5.1 – Horizontal Assets, Probability of Failure

Evaluation Metric	5	4	3	2	1
	Very High	High	Moderate	Low	Very Low
Remaining Useful Life (in Years)	<20	21-30	31-40	41-50	>51
C-factor	<59	60 - 69	70 - 89	90 - 109	>110

5.1.2 Consequence of failure Metrics/Methods

The metrics used to determine the COF for individual water mains are listed below. Each metric was scored on a scale of 1 to 5 with 5 indicating the highest COF. The rubric used in determining the score for each metric used is shown in Table 5.2, while a description of each metric and the reasoning for using said metric is listed below.

1.) Length

The longer the length of water main in need of replacement, the more difficult it will be to replace. The length score was based on the length of water main to be replaced.

2.) Water Service Disruption

Some water mains are more critical to servicing customers of the system. While losing a single water main will typically leave some customers without water, the loss of another more strategically important main can result in hundreds or thousands of customers being without water. The Water Service Disruption COF metric measures the number of customers affected by the loss of a single water main.

3.) Accessibility

Some water mains can be difficult to reach if they were to fail. The harder it is or costlier it is to reach a water main to replace or repair it, the higher the Accessibility COF metric will be.

4.) Critical Customer Impact

The failure of a water main and subsequent loss of service to surrounding customers can have a much greater consequence depending on the user. Critical users in a system are typically hospitals, industry, businesses, schools, and other users who have a population that would be greatly affected by a loss of water. The score for mains near to critical users is determined by the type of user.

5.) Diameter

In general, the larger the diameter of the water main, the more important it is to the water system and subsequently its customers. Also, the damages caused by a significant main break on a larger pipe have more potential to cause damage compared to a smaller pipe. The diameter score was based on the diameter in inches for each water main.

Table 5.2 – Distribution Assets, Consequence of Failure

Evaluation Metric	5 Very High	4 High	3 Moderate	2 Low	1 Very Low
Length (feet)	Over 2000	1001-2000	501-1000	51-500	1-50
Water Service Disruption	Water source; no redundancy	Facility (station, tank) or Connection to >30% of system; no redundancy or 5 with redundancy	Connection to 15-30% of system; no redundancy or 4 with redundancy	Connection to <15% of system; no redundancy or 3 with redundancy	Anything else
Accessibility	Directional Drilled	Under a major road	Under a minor road	In the right of way	Uncongested Area
Critical Customer Impact	Medical Facilities or major industries	Major Living Areas (prison, retirement home, etc.)	School, church, Sizable Business or Government Office	Residential	No Customer
Diameter	≥ 24-inch main	20 to 16-inch main	14 to 12-inch main	10 to 8-inch main	≤ 6-inch main

5.2 Vertical Assets

A criticality assessment of vertical assets in the water system was completed using information gleaned from site visits to water system facilities by FTCH, in conjunction with information provided by the City.

5.2.1 Probability of Failure Metrics/Methods

The metrics used to determine the POF for vertical assets are described below. Each metric was scored on a scale of 1 to 5 with 5 indicating the highest POF. The rubric used in determining the score for each metric used is shown in Table 5.3, while a description of each metric and the reasoning for using said metric is listed below.

1.) Physical Condition

The worse the physical condition of a vertical asset the more likely it is to fail. The physical condition score was determined from the condition of the asset observed during the site visits and City staff input.

2.) Remaining Useful Life

The age of a vertical asset in relation to the typical useful life of that type of asset is important to the POF of the asset. The remaining useful life score was determined using the difference of the age of the asset and its typical useful life.

3.) Operational Complexity

The more complex the operation of a vertical asset is, the more likely one of its components is to fail. The operational complexity score was determined based on the complexity of operating a vertical asset.

4.) Operational Frequency

If a vertical asset is constantly utilized, it is more likely to fail due to the stress of constant operation. The operational frequency score was determined based on the frequency with which an asset is in operation during normal water system operation.

Table 5.3 – Vertical Assets, Probability of Failure

Evaluation Metric	5	4	3	2	1
	Very High	High	Moderate	Low	Very Low
Physical Condition	Very Poor	Poor	Fair	Good	Very Good
Remaining Useful Life	< 20% of useful life remaining	Age between 20% and 40% of useful life remaining	Age between 40% and 60% of useful life remaining	Age between 60% and 80% of useful life remaining	> 80% of useful life remaining
Operational Complexity	Very Complex	Complex	Moderate	Simple	Very Simple
Operational Frequency	Very Frequent	Frequent	Moderate	Irregular	Very Irregular

5.2.2 Consequence of Failure Metrics/Methods

The metrics used to determine the COF for vertical assets are described below. Each metric was scored on a scale of 1 to 5 with 5 indicating the highest COF. The rubric used in determining the score for each metric used is shown in Table 5.4, while a description of each metric and the reasoning for using said metric is listed below.

1.) Water Supply

The importance of a vertical asset to maintaining a supply of water to the system is an important aspect of the COF of that asset. The water supply score is determined based on the effect the loss of a vertical asset would have on the ability of the water system to continue to supply water to its customers.

2.) Water Quality

The importance of a vertical asset to maintaining the quality of water in the system is an important aspect of the COF of that asset. The water quality score is determined based on the effect the loss of a vertical asset would have on the quality of the water in the system.

3.) Financial Impact

If a vertical asset fails, it must be replaced. Depending on the cost of replacing that asset, it can be paid for from the City's budget or force the City to take out a loan. The financial impact score is determined based on the impact of the cost of replacing a vertical asset.

4.) Safety

To maintain a water system, City staff must perform periodic maintenance on and work around vertical assets. The safety of these workers and the general public is important. The failure of certain vertical assets can result in a workplace hazard for City staff or even be a public safety hazard. The safety score is determined based on the threat to City staff and the general public's health due to the failure of a vertical asset. The higher the calculated BRE, the more critical the asset.

Table 5.4 – Vertical Assets, Consequence of Failure

Evaluation Metric	5	4	3	2	1
	Very High	High	Moderate	Low	Very Low
Water Supply	Violation of Regulatory Standard	Process shut-down	Potential process upset	Loss of redundancy	No impact
Water Quality	Violation of Regulatory Standard	Process shut-down	Potential Process Upset	Loss of redundancy	No impact
Financial Impact	Major Cost (> $100,000)	Significant Cost ($50,001-$100,000)	Moderate Cost ($10,001-$50,000)	Minor Cost ($5,001-$10,000)	Insignificant ($1-$5,000)
Safety	Loss of Life	Severe Injury to employees or public	Minor injury requiring treatment off-site or lost time	Minor injury requiring no treatment with no lost time	No injury

5.3 Business Risk Exposure

The assets that have the greatest POF and the greatest COF will be the assets that are most critical to the system. The Business Risk Exposure (BRE) is the overall score that takes into account the POF and COF ratings and quantifies the criticality.

BRE = POF x COF

Since the POF and COF each have a score of 1 through 5, the BRE score is 1 through 25. Refer to Table 5.5 for the BRE Matrix.

Table 5.5 – Business Risk Exposure Matrix

25	20	15	10	5	5	Consequence of Failure
20	16	12	8	4	4	
15	12	9	6	3	3	
10	8	6	4	2	2	
5	4	3	2	1	1	
5	4	3	2	1		
Probability of Failure						

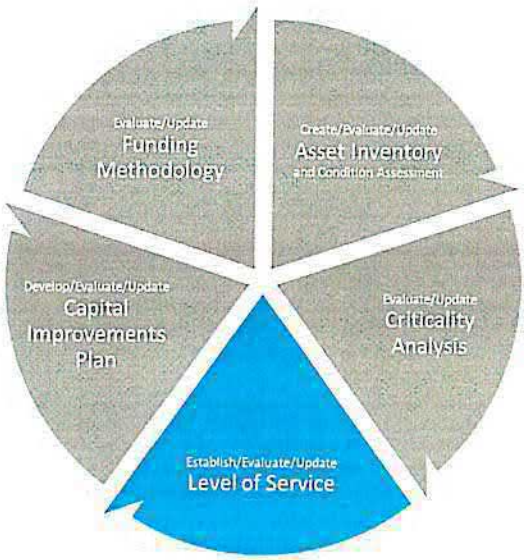
High	High Priority (15 - 25)
Medium	Medium Priority (5 - 14)
Low	Low Priority (1 - 4)

Assets with the highest BRE scores are those that should be rehabilitated or replaced first. Assets with the lowest scores are those that do not currently require any rehabilitation or replacement, but should be monitored at regular intervals to verify the scores do not change. Assets in the middle should be evaluated on a case-by-case basis to determine their priority. The MDEQ guidelines for determining criticality state a BRE score above 15 is deemed high.

As part of the AMP criticality analysis, a BRE value was calculated for every asset in the water system. A map showing the BRE calculated for all the water mains in the system is included in Figure 1. A portion of the BRE calculations for the vertical assets in the system is included in Appendix 1.

6.0 Level of Service Goals

The City's LOS is used to set the fundamental framework for how the water system is operated and to help guide the City with its capital planning. This section describes the LOS the City intends to provide its customers, as well as, the process used to establish the LOS and how it affects the AMP process.



6.1 LOS Philosophy

The City's LOS plays an important role in capital improvements planning. LOS goals are used to prioritize capital investment and guide decision-making. LOS incorporates public health goals and community values, and balances these expectations with available staff, funding and other high priority water system needs. The LOS sets reasonable standards to maintain a balance between customer expectations, their tolerance for service interruptions and their willingness to pay for corresponding capital investment. The LOS also provides the City with a way to document the expectations of their customers, quantify performance targets and track progress.

6.2 LOS Selection

The City's selected LOS were determined based on several goals including delivery of a reliable supply of safe drinking water to its customers, maintaining compliance with local, state and federal regulations, and several technical, managerial and financial goals. Establishing the overall water system LOS for inclusion in the AMP was an iterative process with initial LOS developed by the consulting engineer and modified based on City comment until a consensus set of LOS goals was reached.

6.3 LOS Parameters

The LOS for the City is defined using the following parameters: service categories, LOS goals, metrics to measure progress in achieving goals, and specific targets for those metrics. The LOS table is organized by categories of service. These categories cover the following three service attributes that are important in meeting customer expectations:

- Reliable and Responsive Water Service
- Adequate Capacity
- Recovery of Full Cost of Service

Within each service category are LOS goals that identify how the City strives to meet the service goal. For each goal, there is a Performance Indicator defining how the service is experienced, or received, and a Performance Measure defining the criteria by which each goal/indicator can be measured. The Specific Performance Target is a detailed metric the City targets for each performance indicator. The established LOS for the City water system along with their corresponding indicators, measures and targets are shown in Table 6.1. The City will use the performance targets to determine whether they are meeting the corresponding LOS into the future. The continued monitoring of these performance targets will ensure the City is fulfilling the LOS established for the system. The LOS should continue to be updated in response to changing water system needs and customer expectations.

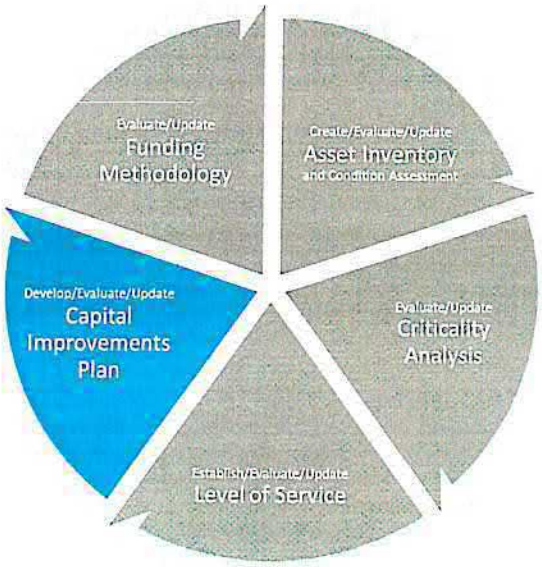
Table 6.1 – Level of Service Table

LEVEL OF SERVICE	PERFORMANCE INDICATOR	PERFORMANCE MEASURE	SPECIFIC PERFORMANCE TARGET
What is the category of Service?	In what ways is the Service experienced or received?	How can the indicator be measured?	What is the target for the measure of each performance indicator?
Reliable and Responsive Water Service	Minimize Service Interruptions/ Disruptions	Number of Service Interruptions/Disruptions per Year.	2 Disruptions of <4 hours 1 Disruptions of 4-12 hours 1 Disruptions of >12 hours per 1,000 customers, per year
	Maintain Regulatory Compliance	Number of Regulatory Violations	Maintain 100% Compliance with drinking water regulations
	Maintain Water Quality throughout the System	Number of Violations of Maximum Contaminant Levels.	No violations
		Number of customer complaints about water quality	Less than 5 customer reports on water quality issues per quarter.
	Minimize Water Main Breaks	Number of water main breaks per year per mile of water main.	1.5 water main breaks per 10 miles of pipe annually.
	Maintain Pressures within Regulatory Standards	Pressures will be maintained between 35 and 100 psi.	Pressure is maintained within these standards 99% of the time.
Adequate Capacity	Provide Emergency and Fire Flow to Customers	% of customers within hydrant coverage	99% hydrant coverage for all customers in the system.
		Meet ISO Standards for available fire flow.	1,500 gpm for 1 hour Residential 2,000 gpm for 2 hours Commercial 3,500 gpm for 3 hours Industrial
	Maintain Adequate Capacity for the System	% of maximum day demands met by Pump Capacity	100% or greater of maximum day demands met by pump capacity
		% of 24-hour average day demand volume met by Storage Capacity	100% or greater of 24-hour average day demand volume met by Storage Capacity
		% of 24-hour average day demands that can be met with standby power	100% or greater of 24-hour average day demands met with standby power
Recover Full Cost of Service	Charge Appropriate Water Rates to Customers	Maintain a Capital Improvements Plan for the Water System	Update Capital Improvements Plan every 3 years
		Maintain Customer Meter Condition and Accuracy	Evaluate condition and accuracy of 5% of meters in system annually
	Minimize Non-Revenue Water	Minimize Unmetered Water Loss	Maintain non-revenue water loss to < 10%
		Calibration of Source Facility and Distribution Facility Meters	Calibrate key meters at facilities and large users regularly

7.0 Capital Improvement Plan

This section summarizes the current CIP for the City and the methods by which the CIP was developed.

7.1 Development of CIP Projects



Proposed capital projects are identified in a number of different ways including review of the criticality analyses from Section 5.0., determination of system needs by staff and system administrators, results of recent planning studies, and coordination with need-based projects for other system utilities (roads, sewer, or storm). The proposed capital projects are then prioritized for completion using the same factors that helped to identify the projects and cost estimates are developed in present day costs.

To keep a water system in good condition, it must be renewed by replacing water mains on a regular basis. The goal is to replace water mains before they can reach the end of their expected useful life. To assess the condition of the City's water system, the expected and remaining useful life of each water main was calculated based on recommendations established in the AWWA report, "Buried No Longer." The useful life calculations are described in more detail in Section 4.1.1.

The CIP was developed based on replacing any water main that had reached the end of its useful life within twenty years. It is estimated that 37.6% of the system will reach the end of its useful life within the next 20 years. The City could replace 1.88% of the system per year for the next 20 years to ensure no water mains in the system reached their useful life in the planning period. The recommended 5-Year CIP replaces 1.78% of the system per year, while the recommended 20-Year CIP replaces 1.77% of the system per year.

The 5-and 20-Year CIP for horizontal assets in the system were developed and prioritized using the factors described above. Estimated costs for the projects were estimated using unit costs from similar constructed water main projects in the region. Costs include excavation, installation of the new main, and restoration above the water main installation site; they do not include road replacement. The costs also include factors for contingency and engineering. The project descriptions, estimated year of completion, water main diameters, water main lengths, water main unit costs, water main total costs, and BRE scores are shown in Appendix 2. A map of the location of each of these projects is shown in Figure 2.

The horizontal asset projects were selected based on a variety of factors. The criticality analysis for each water main was one of the main determinants qualifying a water main for replacement. Other factors for water main replacement included coordination with projects intended for other system utilities, frequency of main breaks and repairs needed for water mains, and hydraulic performance improvement targets identified as part of the City's Reliability Study. Where possible, the horizontal asset projects were prioritized by the BRE score received as part of the criticality analysis.

The 5-and 20-Year CIP for vertical assets in the system were developed and prioritized using the factors described above. Costs for the projects were estimated using a combination of equipment quotes, costs from similar projects, and City input. Contingency and engineering are not included in the projects that involve a simple replacement or rehabilitation of equipment in kind that could be procured directly by the City. However,

contingency and engineering is included for all construction projects. The project descriptions, estimated year of completion, total estimated costs and BRE scores are shown in Appendix 2.

The CIPs presented do not include any provisions for lead service line replacement. It is anticipated that legislation will be issued in the coming year which could greatly increase water system liability for costs for service line replacement. It is recommended that the CIPs be revised as necessary when details on future legislation regarding removal of lead services become known.

7.2 5-Year CIP Projects

The 5-Year CIP includes 7 horizontal asset projects which will require $4,139,000 of funding.

The 5-Year CIP includes 5 vertical asset projects which will require $454,600 of funding. The projects were prioritized using the factors described in Section 7.1. Most of the projects involve basic maintenance, including painting hydrants, tanks, and water department facilities. Installing perimeter fencing and cameras around several water department facilities will increase security and longevity of these properties for the City. Creating a set of construction standards for the City will help guide all future engineering projects to be more consistent.

It is understood that the expected costs and timelines for individual projects may fluctuate based on changing needs in the water system.

7.3 20-Year CIP Projects

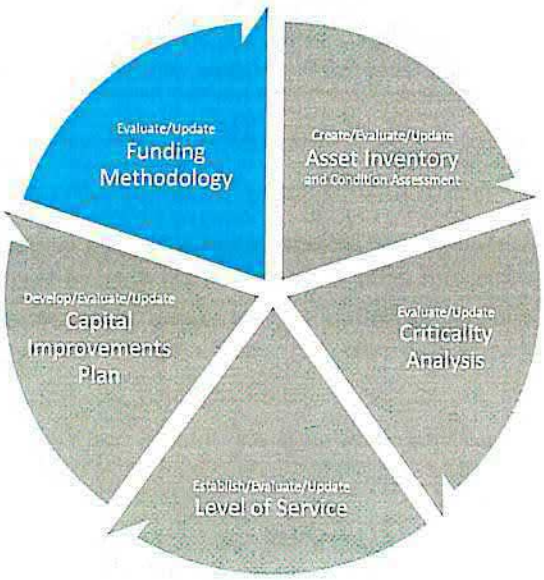
The 20-Year CIP describes projects that would be done 6 to 20 years into the future. The 20-Year CIP includes 24 horizontal asset projects which will require $11,550,000 of funding

The 20-Year CIP includes 1 vertical asset project which will require $7,000,000 of funding. The only capital project included in the 20-Year CIP is the construction of the new municipal services complex. The existing facilities for the Water and Electric departments are outdated. Combining the Electric and Water Departments into a shared building will provide the City with improved facilities for these two departments.

It is understood that the expected costs and timelines for individual projects may fluctuate based on changing needs in the water system.

8.0 Funding Structure and Rate Methodology

The funding structure and rate methodology section of the AMP is intended to ensure that the water system will have funding for future capital improvements projects necessary to maintain the established LOS.



The City has two separate types of monthly water utility rate charges for its customers. The first water utility rate is a commodity charge, which is billed on a per 1,000-gallon basis for usage. This charge is based on funding the cost of operating and maintaining the water system and capital improvements projects. The City bills a fixed "ready-to-serve" charge based on meter size that is intended to fund debt service for the system.

Adjustments to the water rates are calculated by City staff, and at times a third party consultant. The recommended rate adjustments are then submitted to the City Council for approval. In the past, this was done on an "as-needed" basis. Going forward, the City will adjust rates annually. The rate adjustments will be based on a 10-year utility rate model, which considers operation and maintenance costs and planned capital improvements projects. The utility rate model includes rate smoothing, to minimize rate variability from year to year.

The funding structure and rate methodology is further described in the report, City of Saint Louis, MI, Water Asset Management Plan Financial Analysis, December 2017 by Municipal Analytics, LLC. Reference this report for detailed financial information related to funding water system improvements. The financial projections include bond issues in fiscal years 2019 and 2025 to fund project needs not covered by water system revenues.

Establish Revenue Requirements

- Operating and Maintenance Budget
- Capital Improvements Plan
- Set revenue requirement increases necessary to operate and maintain the system
- Calculate annual debt service charges from financing capital improvement projects

Establish Rates

- Provide "smooth" rate increases where possible
- Meet revenue requirements and stay within legal and policy bounds
- Use historical usage patterns and any new assumptions or knowns of the community to set rates to meet revenue requirements based on rate structure
- Keep an eye towards future projects and system needs when setting rates

City of Saint Louis
Business Risk Exposure
NO SCALE

FTC&H

engineers
scientists
architects
constructors

City of Saint Louis
Saint Louis, Michigan

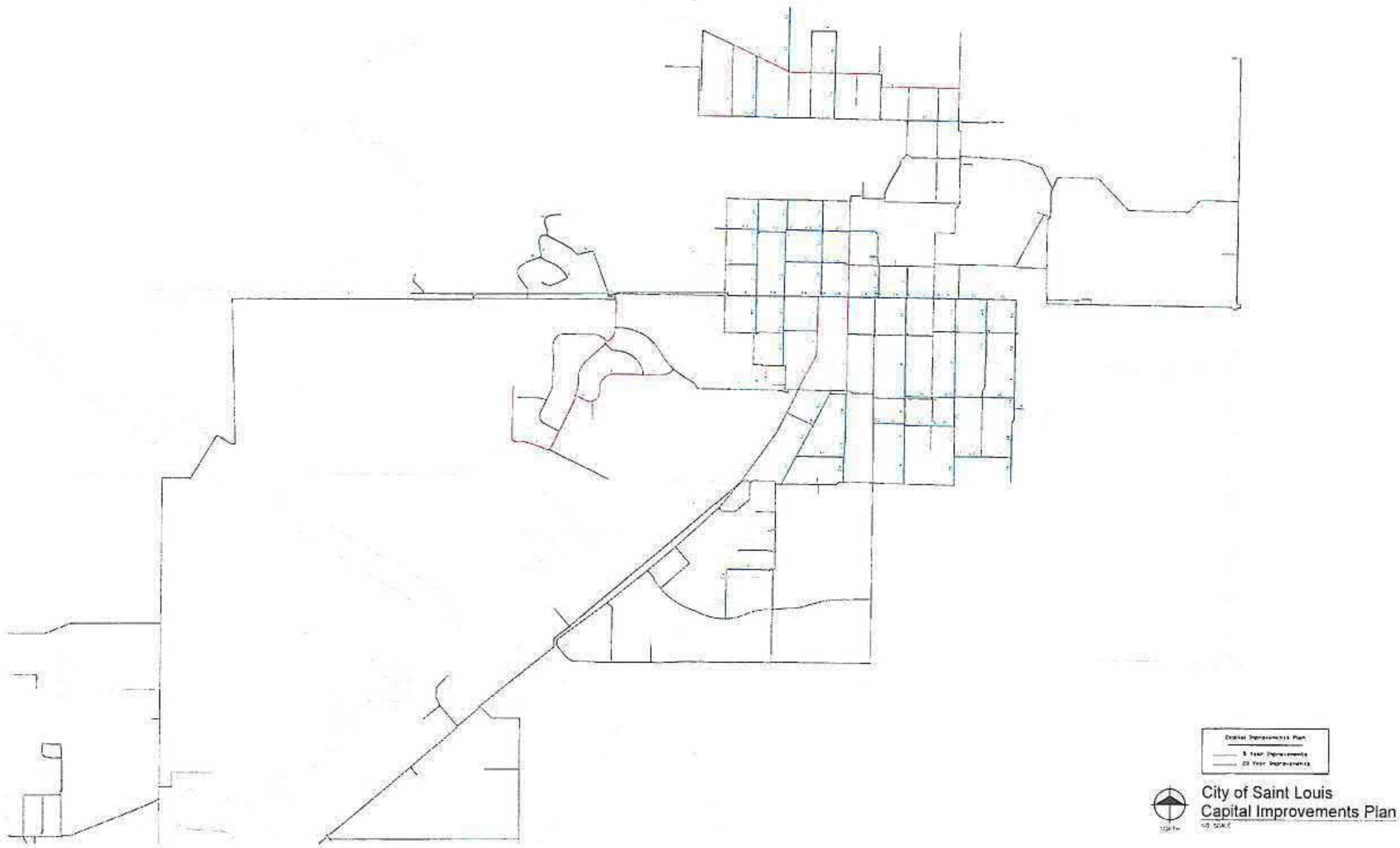
Water Asset Management Program

Drawn By	CSM
Designer	CSM
Reviewer	AR
Manager	AR

Hard copy is intended to be 24"x36" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

PROJECT NO
G171394

SHEET NO
1



City of Saint Louis
Capital Improvements Plan
NO SCALE

ftc&h

engineers
scientists
architects
constructors

City of Saint Louis
Saint Louis, Michigan

Water Asset Management Program

PROJECT NO
G171394

SHEET NO
2

Appendix 1

Facilities Data

Asset Type	Asset ID	Asset Location	Capacity	Cost	Year Installed	Physical Condition	Equipment Age (Years)	Equipment Standard Life	Remaining Life yrs	Remaining Life %	Operational Complexity	Operational Frequency
Steel Single Pedestal Elevated Tank	Crawford Elevated Tank	Crawford Tank	500,000 gal	$2,000,000	1963	Fair	55	100	45	45.44	Simple	Frequent
Control Panel	0	Crawford Tank	0	$15,000	1990	Good	28	25	0	0.00	Complex	Irregular
Main Breaker Load Center	0	Crawford Tank	0	$1,500	1990	Good	28	25	0	0.00	Simple	Irregular
Steel Single Pedestal Elevated Tank	Giddings Street Elevated Tank	Giddings Street	200,000 gal	$1,500,000	2016	Very Good	2	100	98	98.48	Simple	Frequent
Control Panel	0	Giddings Street	0	$15,000	2016	Very Good	2	25	23	93.93	Complex	Irregular
Main Breaker Load Center	0	Giddings Street	0	$1,500	2016	Very Good	2	25	23	93.94	Simple	Irregular

Probability of Failure

Physical Condition Score 1-5	Age Factor Score 1-5	Operations Complexity Score 1-5	Operational Frequency Score 1-5	Probability of Failure 1-5
3	1	3	5	3.0
3	5	5	3	4.0
3	5	3	3	3.5
1	1	3	5	2.5
1	1	5	3	2.5
1	1	3	3	2.0

Consequence of Failure

Water Supply Score 1-5	Water Quality Score 1-5	Financial Impacts Score 1-5	Safety Score 1-5	Consequence of Failure 1-5
5	3	5	5	4.5
3	3	3	3	3.0
3	3	1	3	2.5
5	3	5	3	4.0
3	3	3	3	3.0
3	3	1	3	2.5

Business Risk Exposure (1-25)
13.5
12
8.75
10
7.5
5

Appendix 2

Saint Louis Capital Improvements Plan
Saint Louis Water Asset Management Plan

Percentage Replaced per Year
1.78%

5-Year Horizontal Asset Improvement Estimated Costs

Project No.	Project Description/Location	Estimated Year of Completion	Replacement Main Diameter (inches)	Main Length (feet)	Main Unit Cost ($/foot)	Water Main Cost	BRE Score (1-25)
1	Replace mains west of Cheesman and Devon intersection along Cheesman, then up to meet Pine River Health Care.	2018	8	1,400	$249	$349,000	16.00
2	Replace mains along Devon Street	2019	8	2,600	$249	$647,000	13.00
3	Replace mains along Mill Street from Washington to North Street	2019	12	1,500	$296	$444,000	12.47
4	Replace mains along York Street from Surrey to Devon Street	2020	8	1,800	$249	$448,000	12.00
5	Replace mains along Olive Street from Union Street, down Teaman and west along Prospect	2021	12	5,000	$296	$1,480,000	12.72
6	Replace mains along Mill street from Washington to Hazel	2022	8	1,400	$249	$349,000	11.00
7	Replace 4-inch mains along Michigan and traveling up Pine Street to Washington Avenue	2022	12	1,500	$281	$422,000	11.00
					Cost of 5-Year Horizontal Asset Improvements	$4,139,000	

Saint Louis Capital Improvements Plan
Saint Louis Water Asset Management Plan

5-Year Vertical Asset Improvement Estimated Costs

Project No.	Project Title	Project Year	Project Cost	Short Description	BRE Score (1-25)
1	Fire Hydrant Re-Painting Program	FY 16/17 - 17/18	$16,600	Priming and painting all the fire hydrants.	N/A
2	Municipal Services Complex - Develop City Engineering Standards	FY 17/18	$10,000	Creating a set of development and construction standards to keep everyone on a	N/A
3	Crawford Water Tower Painting and Upgrades	FY 17/18	$350,000	Repaint the tank and some additional upgrades to increase lifespan of tower.	13.50
4	Water Department Garage - Painting	FY 18/19	$8,000	Repaint the Garage.	N/A
5	Municipal Services Complex - Security Fencing	FY 19/20	$70,000	Install cameras and a perimeter fence with powered entrance gate around Water Department, DPW facilities and WWTP.	N/A
		Cost of 5-Year Vertical Asset Improvements	$454,600		

Saint Louis Capital Improvements Plan
Saint Louis Water Asset Management Plan

Percentage Replaced per Year
1.77%

20-Year Horizontal Asset Improvement Estimated Costs

Project No.	Project Description/Location	Estimated Year of Completion	Replacement Main Diameter (inches)	Main Length (feet)	Water Main Cost	Total Estimated Cost	BRE Score (1-25)
8	Replace mains along Franklin Street from Saginaw to State Street	2022	8	3,300	$249	$821,000	11.17
9	Replace mains in Orchard Hills	2023	8	3,700	$264	$976,000	10.83
10	Replace mains along Prospect from Seaman to dead end to east	2024	8	1,500	$249	$374,000	10.60
11	Replace mains along Washington from Clinton to Hubbard Street	2024	8	1,500	$249	$374,000	10.56
12	Replace main along Locust Street from Maple Street to Mill Street	2025	8	700	$249	$175,000	10.56
13	Replace mains along Main Street from Washington to the bridge	2025	8	1,400	$264	$370,000	10.28
14	Replace 4-inch mains along Euclid Street	2026	8	2,900	$249	$722,000	10.13
15	Install main along Walnut from Main Street to East Street and down East Street to Butternut	2027	8	2,400	$249	$597,000	10.00
16	Replace 4-inch mains along Hazel Street	2027	8	1,600	$249	$398,000	10.00
17	Replace mains alnog Corinth Street from Olive Street to dead end to the north	2028	8	950	$249	$237,000	10.00
18	Replace mains along Prospect from Corinth to Teaman Street	2028	8	855	$264	$226,000	9.92
19	Replace mains along Berea, west along Tamarack to Eden Street	2028	8	1,700	$264	$449,000	9.85
20	Replace mains along Bankson from Tyrell to North Street	2029	8	2,000	$249	$498,000	9.83
21	Replace 4-inch mains along Saginaw Street	2030	8	1,500	$249	$374,000	9.71
22	Replace 4-inch mains along Lincoln Street	2030	8	1,100	$249	$274,000	9.60
23	Replace mains along Center Street from Watson to Main	2031	8	2,200	$249	$548,000	9.48
24	Replace mains along West Washington Avenue from the new 16-inch transmission main to Clinton Street	2032	12	2,400	$296	$711,000	9.48
25	Replace mains along Graham Street from Wilson to Woodside	2033	8	1,400	$264	$370,000	9.39
26	Replace mains along Pine Street from Washington to North Street	2033	8	1,600	$249	$398,000	9.16
27	Replace main along Butternut from East to Euclid Street	2034	8	1,500	$249	$374,000	8.80
28	Replace mains along Mill Street from Hazel to State Street	2034	8	1,300	$264	$343,000	8.80
29	Replace mains along Delaware Street from Crawford to North Street	2035	8	2,500	$249	$622,000	8.68
30	Replace mains along East Street from Washington to State	2036	8	2,800	$249	$697,000	8.65
31	Replace mains along Sharon Street from Olive to Prospect Street	2037	8	900	$249	$224,000	8.46
32	Replace mains along Maple Street from Hazel to State Street	2037	8	1,600	$249	$398,000	8.24
					Cost of 20-Year Horizontal Asset Improvements	$11,550,000	

Saint Louis Capital Improvements Plan
Saint Louis Water Asset Management Plan

20-Year Vertical Asset Improvement Estimated Costs

Project No.	Project Title	Project Year	Project Cost	Short Description	BRE Score (1-25)
6	Municipal Services Complex - New Municipal Services Complex	FY 27/28	$7,000,000	Combining Electric and Water Department into a common facility.	N/A
	Cost of 20-Year Vertical Asset Improvements		$7,000,000		

Appendix 3

SUMMARY OF FINANCIAL ANALYSIS AND RATE IMPACTS:

Prior to completing the following summary report of findings, Municipal Analytics reviewed the financial analysis and rate model with the St. Louis City Manager, Finance Director and Director of Public Services. They are in agreement with the overall funding strategy for capital improvements, and the resulting rates required to fund operations, maintenance, replacement, capital and debt. Included below are some snapshots from the rate model, related to water capital, debt, cash and rates. The large changes in monthly RTS are due to a change in rate structure, which brings the City's meter ratios in line with standard AWWA meter ratios.

In the rate model, a portion of fixed O&M costs have been allocated to the commodity charge, to reduce the impact on smaller customers.

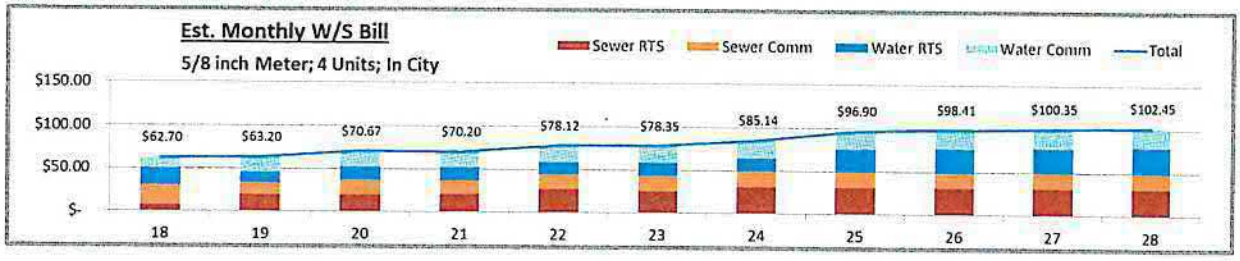
Anticipated 10-year rate structure (will be reviewed and revised annually, to conform to current financial needs and customer base):

	Current 2018	Recommended 2019	Estimated 2020	Estimated 2021	Estimated 2022	Estimated 2023
Monthly WATER RTS						
5/8 inch	$ 19.84	$ 13.06	$ 15.91	$ 14.33	$ 14.49	$ 15.17
3/4 inch	$ 20.36	$ 13.06	$ 15.91	$ 14.33	$ 14.49	$ 15.17
1 inch	$ 20.96	$ 32.66	$ 39.79	$ 35.82	$ 36.23	$ 37.92
1.25 inch	$ 21.32	$ 52.25	$ 63.66	$ 57.30	$ 57.96	$ 60.68
1.5 inch	$ 21.79	$ 65.31	$ 79.57	$ 71.63	$ 72.45	$ 75.84
2 inch	$ 25.28	$ 104.50	$ 127.31	$ 114.61	$ 115.92	$ 121.35
3 inch	$ 28.40	$ 195.94	$ 238.71	$ 214.89	$ 217.35	$ 227.53
4 inch	$ 37.39	$ 326.56	$ 397.86	$ 358.15	$ 362.25	$ 379.22
6 inch	$ 49.10	$ 653.12	$ 795.72	$ 716.30	$ 724.51	$ 758.44
8 inch	$ 62.10	$ 1,045.00	$ 1,273.14	$ 1,146.09	$ 1,159.21	$ 1,213.51
Commodity Charge: WATER	$ 3.24	$ 4.39	$ 4.59	$ 4.68	$ 4.87	$ 4.99

The impact of water rates on a typical residential customer can be seen here:

Customer Impact Estimator-WATER			18 2018 Current Rates	19 2019	20 2020	21 2021	22 2022	23 2023	24 2024	25 2025	26 2026	27 2027	28 2028
Units (1000 gal)	4	Comm	$ 12.96	$ 17.56	$ 18.37	$ 18.72	$ 19.49	$ 19.95	$ 20.54	$ 21.14	$ 21.83	$ 22.46	$ 23.15
Meter Size	5/8 inch	RTS	$ 19.84	$ 13.06	$ 15.91	$ 14.33	$ 14.49	$ 15.17	$ 15.95	$ 27.16	$ 28.06	$ 28.94	$ 29.87
	In City	Total/Mo	$ 32.80	$ 30.62	$ 34.28	$ 33.05	$ 33.98	$ 35.12	$ 36.49	$ 48.30	$ 49.89	$ 51.40	$ 53.02
		% change		-6.6%	12.0%	-3.6%	2.8%	3.3%	3.9%	32.4%	3.3%	3.0%	3.1%

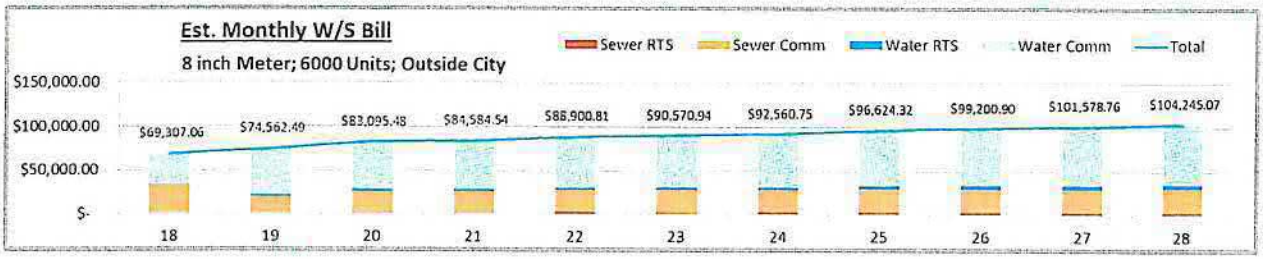
The impact of combined monthly water and sewer bills for a residential customer is summarized in the following 10-year rate forecast:



The City's largest customer is expected to pay substantially more for water under the new rate structure:

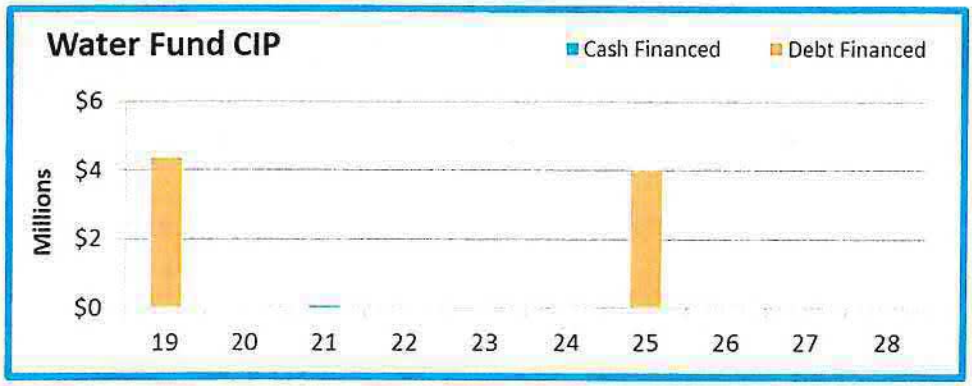
Customer Impact Estimator-WATER			18 2018 Current Rates	19 2019	20 2020	21 2021	22 2022	23 2023	24 2024	25 2025	26 2026	27 2027	28 2028
Units (1000 gal)	6000	Comm	$ 35,215.60	$ 52,674.33	$55,098.31	$56,169.62	$58,477.95	$59,846.49	$61,622.06	$63,431.67	$65,482.63	$67,394.58	$69,444.48
Meter Size	8inch	RTS	$ 124.20	$ 2,089.99	$ 2,546.29	$ 2,292.17	$ 2,318.42	$ 2,427.01	$ 2,551.72	$ 4,345.17	$ 4,490.04	$ 4,629.85	$ 4,778.86
	Outside City	Total/Mo	$ 35,339.80	$ 54,764.33	$57,644.60	$58,461.80	$60,796.37	$62,273.50	$64,173.78	$67,776.84	$69,972.67	$72,024.43	$74,223.33
		% change		55.0%	5.3%	1.4%	4.0%	2.4%	3.1%	5.6%	3.2%	2.9%	3.1%

However, due to proposed changes to the City's sewer rate structure, the overall impact on the largest customer is expected to be much less severe:

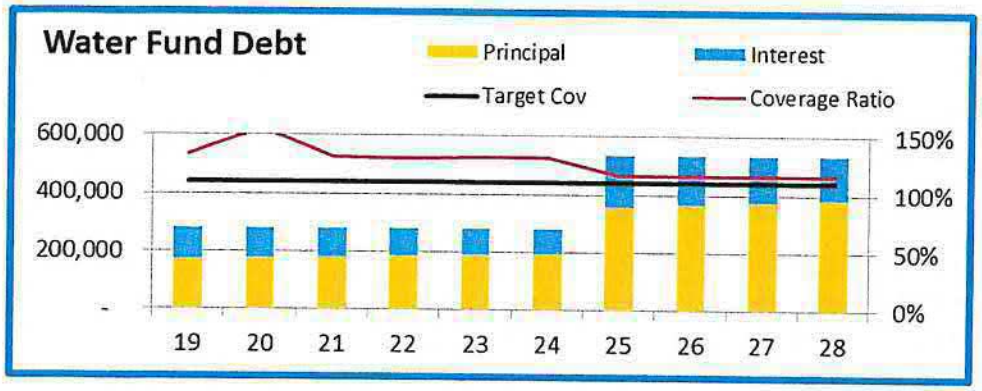


The rates above are expected to be sufficient to meet the revenue needs of the Water Fund and avoid any gap in funding, as illustrated in revenue and expense comparison chart below:

Based on the capital projects identified in the City's Water AMP, the City anticipates two bond issues over the next ten years, along with a minimal amount of capital funding from cash:



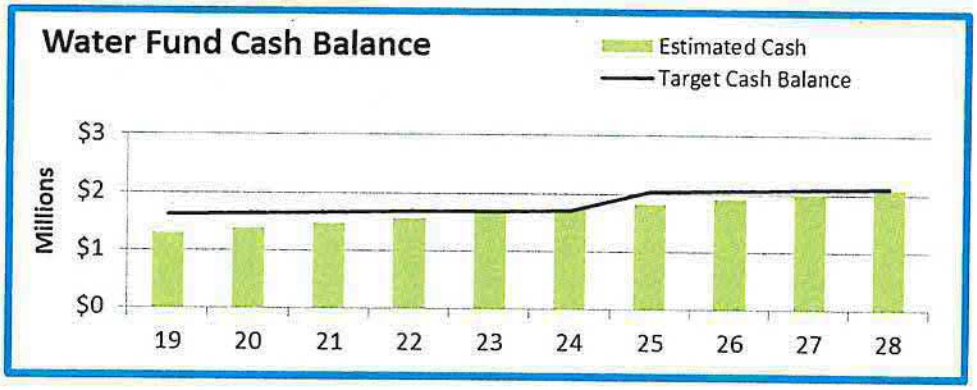
The debt service associated with the above bond issues, as well as the estimated bond coverage ratios, are illustrated here:



The forecasted cash balance in the Water Fund is summarized in the following chart. The difference between estimated cash balances and target cash balances is not significant. As part of our rate analysis, we are recommending the City consider 4 separate cash reserves:

- 90 days O&M expenses
- 125% of annual debt service requirements
- 10% of replacement value of water assets
- Customer deposits

The difference between estimated and target cash is well within the O&M reserve amount, which simply means the City should be able to meet it obligated reserves, but may fall a little short in the O&M reserve. Raising rates to cover this gap is warranted at this time.



City of St. Louis, Michigan

Water Asset Management Plan (WAMP) Funding Structure and Rate Methodology
Response to Notice of Deficiencies in Original Report

As part of the City of St. Louis' Water System Asset Management Plan developed by Fishbeck, Thompson, Carr & Huber (FTCH) engineers in 2017, Municipal Analytics developed a utility financial plan and user charge system model, which incorporated the capital projects identified in the WAMP. The developed WAMP was approved by the Michigan DEQ, Division of Drinking Water and Municipal Assistance, in 2018. The initial approval did not include the financial components of the report, which, after further review, identified three deficiencies in the financial and rate components of the report submitted by FTCH. This Response provides the specific information requested by the State to address deficiencies in the original WAMP submittal from December 2017.

Deficiency #1:
The submittal did not include the current operating budget for the water system. The budget must list the day to day operation and maintenance expenses in either the prior or current year. These can be combined into categories such as wages, chemicals, insurance, etc., but cannot be listed as a single expense. The budget must also list all sources of revenue. Ideally these would be broken down into categories (e.g., revenues from sales, meter charges, bond sales, etc.) as well.

Response #1:
Listed below are the revenues and expenditures for the first year of the new rates, calculated to fund the capital needs identified in the WAMP:

GL NUMBER	DESCRIPTION	Estimate 2019
Fund 592 - WATER & SEWER FUND (WATER ONLY REVENUES AND EXPENDITURES)		
Revenues		
Dept 000		
592.000.665.000.591	INTEREST-WATER	2,364
Dept 591-WATER		
592.591.645.000	SALES	2,032,422
592.591.646.000	ON/OFF SERVICE FEE	5,601
592.591.657.000	PENALTIES	12,410
592.591.667.000	RENTAL INCOME	44,097
592.591.678.000	MISCELLANEOUS REIMBURSEMENT	456
592.591.695.000	MISCELLANEOUS	315
SUBTOTAL		2,095,301
TOTAL REVENUES		**2,097,664**

GL NUMBER	DESCRIPTION	Estimate 2019
Fund 592 - WATER & SEWER FUND (WATER ONLY REVENUES AND EXPENDITURES)		
Expenditures		
Dept 591-WATER		
592.591.702.000	SALARY & WAGES	245,630
592.591.710.000	EMPLOYEE BENEFITS	143,100
592.591.726.000	SUPPLIES	35,700
592.591.728.000	DUES & FEES	4,080
592.591.729.000	POSTAGE	5,100
592.591.801.000	PROFESSIONAL SERVICES	32,135
592.591.818.000	CONTRACTED SERVICES	35,000
592.591.850.000	COMMUNICATIONS	2,652
592.591.860.000	TRAVEL/CONF/WORKSHOPS	2,550
592.591.895.000	MEMBERSHIP & DUES	1,428
592.591.910.000	INSURANCE & BONDS	8,670
592.591.920.000	UTILITIES	8,400
592.591.921.000	PURCHASED WATER FROM ALMA	708,734
592.591.923.000	ELECTRICITY - PUMPING	10,400
592.591.930.000	REPAIRS & MAINTENANCE	25,750
	NEW TECH MTC AGREEMENTS/LICENSES	8,670
592.591.943.000	EQUIPMENT RENTAL	45,900
592.591.950.000	OVERHEAD CHARGES	247,401
592.591.956.000	MISCELLANEOUS	1,492
592.591.967.000	CAPITAL OUTLAY BELOW CO POLICY	453
	Rate-financed capital	8,000
592.591.968.000	DEPRECIATION	-
SUBTOTAL		1,581,245
	WATER DEBT	
	INTEREST EXPENSE ON DEBT	108,750
	PRINCIPAL ON DEBT	170,290
SUBTOTAL		279,040
Dept 966-TRANSFERS OUT		
592.966.998.245.591	TRANSFER OUT-PUBLIC IMPROV-WATER	32,379
TOTAL EXPENDITURES		**1,892,664**
NET REVENUES (EXPENDITURES)		**205,000**

Deficiency #2:

The submittal did not include calculations that develop rates and charges, which provide sufficient revenues to cover operating expenses for the water system. The sources of revenues must be broken down and calculations shown. Thus, annual water volume sold, and customer numbers need to be included. That way the revenue projections can be proven. Detail out how much water is sold and at what price along with meter and/or other charges if they are applicable. These calculations should add

up to at least the amount of revenue projected in the budget or an explanation of any additional revenues needs to be provided.

Response #2:
The rate model developed for the City of St. Louis assigns operations, capital and debt service to fixed and variable costs. Revenue requirements were increased by $205,000 in FY 2019, to ensure adequate cash reserves in the utility fund,. To calculate rates, variable costs are divided by the estimated annual volume of billable units, and fixed costs are divided by the total number of residential equivalent meters.

Water Commodity Rate Calculation (FY 2019):
Total variable water costs: $1,473,727
Total billable units: 348,400 (187,600 in-city units, plus 160,800 outside-city units [80,400 metered units billed at 2x in-city rate])
Water commodity rate: $1,473,727 / 348,400 = $4.23/unit

Revenues from metered water sales:
In-city: 187,600 units x $4.23/unit = $793,548
Outside-city: 80,400 units x $4.23/unit x 200% (outside city surcharge) = $680,184
Total metered water sales revenue: $1,473,732

Water Readiness to Serve Charge Calculation (FY 2019):
Total fixed water costs: $558,695
Total residential equivalent meters: 2,045
RTS per residential equivalent meter per month: $22.77

Revenues from water RTS charge:

Monthly WATER RTS	2019 RTS Charge	Accounts	Annual Bills	Annual Revenue
5/8 inch	$ 22.77	1,273	12	$ 347,869
3/4 inch	$ 22.77	66	12	$ 18,036
1 inch	$ 56.93	41	12	$ 28,010
1.25 inch	$ 91.09		12	$ -
1.5 inch	$ 113.86	10	12	$ 13,663
2 inch	$ 182.18	26	12	$ 56,840
3 inch	$ 341.58	1	12	$ 4,099
4 inch	$ 569.31	4	12	$ 27,327
6 inch	$ 1,138.61	3	12	$ 40,990
8 inch	$ 1,821.78	1	12	$ 21,861
				$ 558,695

Total Rate Revenues from Detailed Budget (FY 2019):
592.591.645.000 SALES $2,032,422

Total Rate Revenue from Commodity and RTS, based on above calculations (FY 2019):
Total metered water sales revenue: $1,473,732
Total water RTS revenue: 558,695
Total water revenue from rates: $2,032,427

Deficiency #3:
The submittal did not include a current rate ordinance or rate resolution that implements the necessary rates and charges for sufficiency for the water system. Rates and charges identified in a rate resolution or ordinance must meet or exceed those rates and charges calculated in the rate methodology.

Response #3:
See attached City of St. Louis Water & Sewer Rate Schedule, effective July 1, 2018 (the City's 2019 fiscal year).

Keith Risdon

From: Willemin, John <jawillemin@ftch.com>
Sent: Wednesday, February 27, 2019 11:07 AM
To: Keith Risdon
Cc: McCorkle, Colin G.
Subject: FW: St. Louis Drinking Water AMP Financial Comments
Attachments: SaintLouisFinancials.pdf

Keith,

On the water side there has been some confusion as to how much detail DEQ wanted. We've had financial people tell us that they purposely didn't include as much financial detail on the water AMPs because they were being told by Bob Schneider on the SAW projects that he didn't need it, and only wanted a summary. Now we are finding that review comments are coming back (a year after submittal) requesting more detail. We've had cases where no feedback was provided until a sanitary survey was received with deficiencies for not having enough detail in the AMPs. So, it has been a little frustrating.

John Kaczor may have the requested information prepared and it just needs to be submitted. The exception being the rate ordinance or rate resolution. I don't recall if that was finalized when the AMP was submitted, but I seem to recall you guys were working on that.

Do you want us to reach out to John, or do you prefer to?

We can update the AMP to include the new information and reissue.

Thanks,
John

From: McCorkle, Colin G.
Sent: Wednesday, February 27, 2019 10:50 AM
To: Willemin, John <jawillemin@ftch.com>
Subject: RE: St. Louis Drinking Water AMP Financial Comments

We have a report from John Koczar attached to the WAMP. It is more of a summary than the entire report. Without seeing the full report, I won't know if it has everything necessary. Similar situation to Ludington. They didn't want nitty-gritty of financials, now they do.

I've attached the financial information provided, which we referenced and appended to the report.

I suspect if we provide the full report that Bob Schneider will be happy. If John Kaczor can provide his report to us, we could possibly fill in any details or let him know where more information is needed.

Colin McCorkle | Staff Engineer | 616.464.3825 | www.ftch.com
Fishbeck, Thompson, Carr & Huber, Inc. | Engineers, Scientists, Architects, Constructors

From: Keith Risdon <krisdon@stlouismi.com>
Sent: Wednesday, February 27, 2019 10:38 AM

ITEM NO. 7d
DATE 5/1/18

ORDINANCE NO. B-236

AN ORDINANCE TO AMEND SECTION 66-105 ESTABLISHMENT OF CHARGE ACTIONS BY RESOLUTION; DIVISION 2 WATER SECTION 66-106 WATER RATES AND CHARGES; 66-107 CONNECTION CHARGES; 66-108 WATER RATES OUTSIDE OF CORPORATE LIMITS; 66-109 REVIEW OF RATES, OF THE ST. LOUIS CITY CODE

The City of St. Louis ordains:

The St. Louis City Code, provided for at Section 66-105 through Section 66-109 of the St. Louis City Code is hereby amended as follows:

Section 1. Establishment of charge actions by resolution.

The use rates, special rates and any fees and/or surcharges to be imposed by this article shall be in accordance with the respective schedule for such charges as established by the City Council from time to time. Any changes of such charges shall be established pursuant to resolution of the Council.
(Ord. No. B-38, § 1. 12-17-79)

DIVISION 2. WATER

Section 2. Water rates and charges.

The rates to be charged for water service furnished by the system shall be in accordance with the respective schedule for such charges as established by the City Council from time to time. Any changes of such charges shall be established pursuant to resolution of the Council. These rates shall consist of the following:

1. Commodity charge.
2. Readiness to service charge, intended to recover as much of the fixed operating, debt and capital costs of the system as may be deemed appropriate by the City Council.
3. A separate charge for in-city flat rate customers.

Ord. No. B-38, § 1, 12-17-79)

Section 3. Connection charges.

For water connections to the system, the charge to the user so connecting shall be fixed from time to time by City Council by resolution.
(Ord. No. B-38, § 1, 12-17-79; Ord. No. B-113, § 1, 10-22-96)

Section 4. Water rates outside of corporate limits.

Whenever the system is supplying water service to premises located outside the corporate limits of the City, the rates for this service shall be fixed by the City Council.

(Ord. No. B-38, § 1, 12-17-79)

Section 5. Review of rates.

The adequacy of the water rates and charges shall be reviewed and adjusted annually. Water rates and charges shall be revised periodically to reflect changes in debt service or a change in operation and maintenance costs including replacement costs in accordance with applicable federal regulations.

DIVISION 3. SEWAGE

Section 6. Sewer use charges and rates.

Each premise abutting a public gravity sanitary sewer line within the City which is required to connect to said sanitary sewer line by the provisions of this chapter, shall pay a use charge based on the rates set forth in this division. Said charges shall be due and payable and commence as of the date said premises are connected to the system.
(Ord. No. B-38, § 1, 12-17-79)

Section 7. Sewer rates and charges.

The rates to be charged for sewer service furnished by the system shall be in accordance with the respective schedule for such charges as established by the City Council from time to time. Any changes of such charges shall be established pursuant to resolution of the Council. These rates shall consist of the following:

1. Commodity Charge.
2. Readiness to service charge, intended to recover as many of the fixed operating, debt and capital costs of the system as may be deemed appropriate by the City Council.
3. Surcharge for extra strength wastewater, which exceeds the concentration limits established in Sec. 66-113 of this Ordinance.
4. A separate charge for in-city flat rate customers.

Section 8. Basis of billing charges.

The basic user charge for wastes having the following normal concentrations: (a) A five-day, 20-degree centigrade biochemical oxygen demand (BOD) of 150 mg/l; (b) A suspended solids (SS) content of 225 mg/l; (c) A phosphate (as P) content of 12 mg/l shall be based on:

1. Premises with metered City water service: Water usage as recorded by water meters and/or sewage meters: or
2. Premises without metered City water service: Each premise abutting a public gravity sanitary sewer line within the City which is required to connect to said sanitary sewer line by the City water system shall be charged on the following basis: A flat rate multiplied by a factor representing a ratio of sewage use by such class of premises to normal single-family residential use, as reflected in Appendix A to this chapter;

A meter may be installed at the request of the owner, and at his expense, on the private water supply. All installation, repairs, maintenance and other service costs shall be paid by the owner.
(Ord. No. B-38, § 1, 12-17-79)

Section 9. Surcharges.

The surcharge will be based on water usage as recorded by water meters and/or sewage meters for all wastes which exceed the 165 mg/l, 250 mg/l, 14 mg/l concentration for BOD, SS and P, respectively.
(Ord. No. B-38, § 1, 12-17-79)

Section 10. Industrial cost recovery.

When industrial user, as defined in 40 CFR 35.905-8, requests connection to the public sewage collection and disposal system, an industrial cost recovery system must be developed in accordance with 40 CFR 35.928.
(Ord. No. B-38, § 1, 12-17-79)

Section 11. Review of rates.

The adequacy of the sewer rates and charges shall be reviewed and adjusted annually. Sewer rates and charges shall be revised periodically to reflect changes in debt service or a change in operation and maintenance costs including replacement costs in accordance with applicable federal regulations.
(Ord. B-38, § 1, 12-17-79)

Section 12. Connection charges, debt service charges.

In addition to the user charges established above, users of the system shall pay, for the privilege of connecting to the system, payable at the time application is made for connection to the system, connection charges to be set from time to time by resolution of the City Council. A separate charge shall be made or debt service charges, which shall be set by City Council resolution.
(Ord. No. B-38, § 1, 12-17-79)

Section 13. Sewer rates outside of corporate limits.

Whenever the system is supplying sewage disposal service to premises located outside the corporate limits of the City, the rates for this service shall be fixed by the City Council.
(Ord. B-38, § 1, 12-17-79)

Section 14. Summer sewer adjustment.

The City may adjust residential customer sewer commodity charges during the period May 20 – September 20, by using the lesser of the actual monthly metered water

consumption, or the average monthly water consumption during the eight months prior to May 20. This adjustment shall not be available to non-residential sewer customers.

Section 15. Separability.

If any section, subsection, paragraph, sentence, clause, phrase or portion of this ordinance is, for any reason, held invalid or unconstitutional by any Court of competent jurisdiction, such portion shall be deemed a separate, distinct and independent provision and such holding shall not affect the validity of the remaining portions thereof.

Section 16. Ordinance repealed.

All ordinances and/or parts of ordinance inconsistent with this ordinance are hereby repealed.

Section 17. Effective date.

This ordinance shall take effect and be in force 15 days from and after its enactment as provided by the City Charter.

Passed and approved by the City Council of the City of St. Louis, Michigan, in regular session, held May 1, 2018.

We the undersigned, Mayor and Clerk of the City of St. Louis, Michigan, do hereby certify that the above and foregoing Ordinance, known as Ordinance B-236 of the City of St. Louis, Michigan, was introduced at a regular meeting of the City Council held on the 17th day of April, 2018, and was thereafter passed at a regular meeting on the 1st day of May, 2018, at least two weeks elapsing between the introduction and the enactment.

Dated at St. Louis, Michigan, this 1st day of May, 2018.

_____

James C. Kelly, Mayor

_____

Mari Anne Ryder, Clerk

ITEM NO. 9A
DATE 4/17/2018

ORDINANCE NO. B-236

AN ORDINANCE TO AMEND SECTION 66-105 ESTABLISHMENT OF CHARGE ACTIONS BY RESOLUTION, DIVISION 2 WATER SECTION 66-106 WATER RATEWS AND CHARGES, 66-107 CONNECTION CHARGES, 66-108 WATER RATES OUTSIDE OF COORPORATE LIMITS, 66-109 REVIEW OF RATES, OF THE ST. LOUIS CITY CODE

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(Ord. No. B-38, § 1, 12-17-79)

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1. Commodity charge.
2. Readiness to service charge, intended to recover as much of the fixed operating, debt and capital costs of the system as may be deemed appropriate by the city council.
3. A separate charge for in-city flat rate customers.

(Ord. No. B-38, § 1, 12-17-79)

Section 3. Connection charges.

For water connections to the system, the charge to the user so connecting shall be fixed from time to time by City Council by resolution.
(Ord. No. B-38, § 1, 12-17-79; Ord. No. B-113, § 1, 10-22-96)

Section 4. Water rates outside of corporate limits.

Whenever the system is supplying water service to premises located outside the corporate limits of the city, the rates for this service shall be fixed by the City Council.
(Ord. No. B-38, § 1, 12-17-79)

Section 5. Review of rates.

The adequacy of the water rates and charges shall be reviewed and adjusted annually. Water rates and charges shall be revised periodically to reflect changes in debt service or a change in operation and maintenance costs including replacement costs in accordance with applicable federal regulations.

DIVISION 3. SEWAGE

Section 6. Sewer use charges and rates.

Each premise abutting a public gravity sanitary sewer line within the City which is required to connect to said sanitary sewer line by the provisions of this chapter, shall pay a use charge based on the rates set forth in this division. Said charges shall be due and payable and commence as of the date said premises are connected to the system.
(Ord. No. B-38, § 1, 12-17-79)

Section 7. Sewer rates and charges.

The rates to be charged for sewer service furnished by the system shall be in accordance with the respective schedule for such charges as established by the City Council from time to time. Any changes of such charges shall be established pursuant to resolution of the Council. These rates shall consist of the following:

1. Commodity charge.
2. Readiness to service charge, intended to recover as many of the fixed operating, debt and capital costs of the system as may be deemed appropriate by the City Council.
3. Surcharge for extra strength wastewater, which exceeds the concentration limits established in Sec. 66-113 of this ordinance.
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Section 8. Basis of billing charges.

The basic user charge for wastes having the following normal concentrations: (a) A five-day, 20-degree centigrade biochemical oxygen demand (BOD) of 150 mg/l; (b) A suspended solids (SS) content of 225 mg/l; (c) A phosphate (as P) content of 12 mg/l shall be based on:

1. *Premises with metered City water service:* Water usage as recorded by water meters and/or sewage meters; or

2. *Premises without metered city water service:* Each premise abutting a public gravity sanitary sewer line within the City which is required to connect to said sanitary sewer line by the provisions of this chapter but is not metered by the City water system shall be charged on the following basis:

a. A flat rate multiplied by a factor representing a ratio of sewage use by such class of premises to normal single-family residential use, as reflected in Appendix A to this chapter;

b. A meter may be installed at the request of the owner, and at his expense, on the private water supply. All installation, repairs, maintenance and other service costs shall be paid for by the owner.

(Ord. No. B-38, § 1, 12-17-79)

Section 9. Surcharges.

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Section 11. Review of rates.

The adequacy of the sewer rates and charges shall be reviewed and adjusted annually. Sewer rates and charges shall be revised periodically to reflect changes in debt service or a change in operation and maintenance costs including replacement costs in accordance with applicable federal regulations.
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In addition to the user charges established above, users of the system shall pay, for the privilege of connecting to the system, payable at the time application is made for connection to the system, connection charges to be set from time to time by resolution of the City Council. A separate charge shall be made for debt service charges, which shall be set by City Council resolution.
(Ord. No. B-38, § 1, 12-17-79; Ord. No. B-114, § 1, 10-22-96)

Section 13. Sewer rates outside of corporate limits.

Whenever the system is supplying sewage disposal service to premises located outside the corporate limits of the City, the rates for this service shall be fixed by the City Council.

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The City may adjust residential customer sewer commodity charges during the period May 20 – September 20, by using the lesser of the actual monthly metered water consumption, or the average monthly water consumption during the eight months prior to May 20. This adjustment shall not be available to non-residential sewer customers.

Section 15. Separability. If any section, subsection, paragraph, sentence, clause, phrase or portion of this ordinance is, for any reason, held invalid or unconstitutional by any Court of competent jurisdiction, such portion shall be deemed a separate, distinct and independent provision and such holding shall not affect the validity of the remaining portions thereof.

Section 16. Ordinances Repealed. All ordinances and/or parts of ordinances inconsistent with this ordinance are hereby repealed.

Section 17. Effective Date. This ordinance shall take effect and be in force 15 days from and after its enactment as provided by the City Charter.

Passed and approved by the City Council of the City of St. Louis, Michigan, in regular session, held May 1, 2018.

We, the undersigned, Mayor and Clerk of the City of St. Louis, Michigan, do hereby certify that the above and foregoing Ordinance, known as Ordinance No. B-236 of the City of St. Louis, Michigan, was introduced at a regular meeting of the City Council held on the 17th day of April, 2018, and was thereafter passed at a regular meeting on the 1st day of May, 2018, at least two weeks elapsing between the introduction and the enactment.

Dated at St. Louis, Michigan, this 1st day of May, 2018.

_____

James C. Kelly, Mayor

_____

Mari Anne Ryder, Clerk

MariAnne Ryder

From: Kurt Giles
Sent: Thursday, April 12, 2018 11:28 AM
To: MariAnne Ryder
Subject: FW: St. Louis water and sewer utility rate ordinance
Attachments: Utility ordinance language change recommendations.docx

Here is that document.
Kurt

From: John Kaczor [mailto:johnk@municipalanalytics.com]
Sent: Saturday, January 13, 2018 12:07 AM
To: Kurt Giles <kgiles@stlouismi.com>; agc@fpmc-law.com
Cc: Bobbie Marr <bmarr@stlouismi.com>; Keith Risdon <krisdon@stlouismi.com>
Subject: St. Louis water and sewer utility rate ordinance

Attached is a file with proposed changes to the City of St. Louis water and sewer ordinance language related to rates and charges. The objective was to provide sufficient latitude to the city council to revise the rates sufficiently to maintain fiscal sustainability of the utilities. The rates I will be recommending comply with the proposed language.

If you have questions about any suggested changes, please let me know. Feel free to make further changes that could improve the language. I'm sure Tony is well qualified to improve on my writing!

John Kaczor
Municipal Analytics
734-277-4454
johnk@municipalanalytics.com

Keith Risdon

From: Swendsen, Kurt (DEQ) <SWENDSENK@michigan.gov>
Sent: Tuesday, February 19, 2019 3:04 PM
To: Kurt Giles
Cc: Keith Risdon; Schneider, Robert (DEQ)
Subject: St. Louis Drinking Water AMP Financial Comments

Hi Kurt,

I gave an approval for the city of St. Louis's Water System AMP last year but it didn't include a review of the fifth section of the AMP, which was the financial components. That section was reviewed by Bob Schneider (517) 388-6466 (he is copied on this email) and the comments are below. If you respond to Bob by email, could you please copy me?

1. The submittal did not include the current operating budget for the water system. The budget must list the day to day operation and maintenance expenses in either the prior or current year. These can be combined into categories such as wages, chemicals, insurance, etc., but cannot be listed as a single expense. The budget must also list all sources of revenue. Ideally these would be broken down into categories (e.g., revenues from sales, meter charges, bond sales, etc.) as well.
2. The submittal did not include calculations that develop rates and charges, which provide sufficient revenues to cover operating expenses for the water system. The sources of revenues must be broken down and calculations shown. Thus, annual water volume sold, and customer numbers need to be included. That way the revenue projections can be proven. Detail out how much water is sold and at what price along with meter and/or other charges if they are applicable. These calculations should add up to at least the amount of revenue projected in the budget or an explanation of any additional revenues needs to be provided.
3. The submittal did not include a current rate ordinance or rate resolution that implements the necessary rates and charges for sufficiency for the water system. Rates and charges identified in a rate resolution or ordinance must meet or exceed those rates and charges calculated in the rate methodology.

Kurt Swendsen I District Engineer – Lansing District Office I 517-525-1487 I swendsenk@michigan.gov
DEQ – Drinking Water and Municipal Assistance Division
Constitution Hall, 525 West Allegan Street, P.O. Box 30242, Lansing, Michigan 48909-8311

Appendix 3

SUMMARY OF FINANCIAL ANALYSIS AND RATE IMPACTS:

Prior to completing the following summary report of findings, Municipal Analytics reviewed the financial analysis and rate model with the St. Louis City Manager, Finance Director and Director of Public Services. They are in agreement with the overall funding strategy for capital improvements, and the resulting rates required to fund operations, maintenance, replacement, capital and debt. Included below are some snapshots from the rate model, related to water capital, debt, cash and rates. The large changes in monthly RTS are due to a change in rate structure, which brings the City's meter ratios in line with standard AWWA meter ratios.

In the rate model, a portion of fixed O&M costs have been allocated to the commodity charge, to reduce the impact on smaller customers.

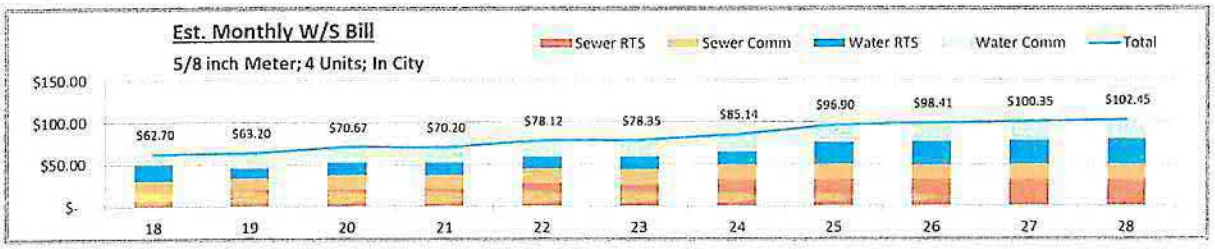
Anticipated 10-year rate structure (will be reviewed and revised annually, to conform to current financial needs and customer base):

	Current	Recommended	Estimated	Estimated	Estimated	Estimated
	2018	2019	2020	2021	2022	2023
Monthly WATER RTS						
5/8 inch	$ 19.84	$ 13.06	$ 15.91	$ 14.33	$ 14.49	$ 15.17
3/4 inch	$ 20.36	$ 13.06	$ 15.91	$ 14.33	$ 14.49	$ 15.17
1 inch	$ 20.96	$ 32.66	$ 39.79	$ 35.82	$ 36.23	$ 37.92
1.25 inch	$ 21.32	$ 52.25	$ 63.66	$ 57.30	$ 57.96	$ 60.68
1.5 inch	$ 21.79	$ 65.31	$ 79.57	$ 71.63	$ 72.45	$ 75.84
2 inch	$ 25.28	$ 104.50	$ 127.31	$ 114.61	$ 115.92	$ 121.35
3 inch	$ 28.40	$ 195.94	$ 238.71	$ 214.89	$ 217.35	$ 227.53
4 inch	$ 37.39	$ 326.56	$ 397.86	$ 358.15	$ 362.25	$ 379.22
6 inch	$ 49.10	$ 653.12	$ 795.72	$ 716.30	$ 724.51	$ 758.44
8 inch	$ 62.10	$ 1,045.00	$ 1,273.14	$ 1,146.09	$ 1,159.21	$ 1,213.51
Commodity Charge: WATER	$ 3.24	$ 4.39	$ 4.59	$ 4.68	$ 4.87	$ 4.99

The impact of water rates on a typical residential customer can be seen here:

			18	19	20	21	22	23	24	25	26	27	28
Customer Impact Estimator-WATER			2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
			Current Rates										
Units (1000 gal)	4	Comm	$ 12.96	$ 17.56	$ 18.37	$ 18.72	$ 19.49	$ 19.95	$ 20.54	$ 21.14	$ 21.83	$ 22.46	$ 23.15
Meter Size	5/8 inch	RTS	$ 19.84	$ 13.06	$ 15.91	$ 14.33	$ 14.49	$ 15.17	$ 15.95	$ 27.16	$ 28.06	$ 28.94	$ 29.87
	In City	Total/Mo	$ 32.80	$ 30.62	$ 34.28	$ 33.05	$ 33.98	$ 35.12	$ 36.49	$ 48.30	$ 49.89	$ 51.40	$ 53.02
		% change		-6.6%	12.0%	-3.6%	2.8%	3.3%	3.9%	32.4%	3.3%	3.0%	3.1%

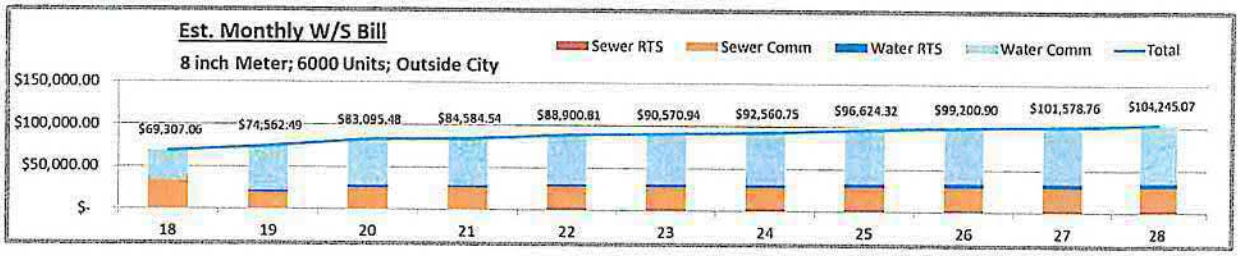
The impact of combined monthly water and sewer bills for a residential customer is summarized in the following 10-year rate forecast:



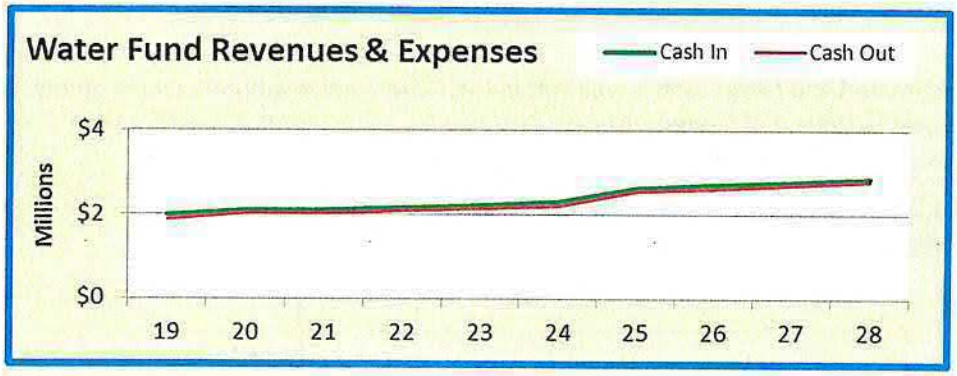
The City's largest customer is expected to pay substantially more for water under the new rate structure:

Customer Impact Estimator-WATER			18 2018 Current Rates	19 2019	20 2020	21 2021	22 2022	23 2023	24 2024	25 2025	26 2026	27 2027	28 2028
Units (1000 gal)	6000	Comm	$ 35,215.60	$ 52,674.33	$55,098.31	$56,169.62	$58,477.95	$59,846.49	$61,622.06	$63,431.67	$65,482.63	$67,394.58	$69,444.48
Meter Size	8 inch	RTS	$ 124.20	$ 2,089.99	$ 2,546.29	$ 2,292.17	$ 2,318.42	$ 2,427.01	$ 2,551.72	$ 4,345.17	$ 4,490.04	$ 4,629.85	$ 4,778.86
	Outside City	Total/Mo	$ 35,339.80	$ 54,764.33	$57,644.60	$58,461.80	$60,796.37	$62,273.50	$64,173.78	$67,776.84	$69,972.67	$72,024.43	$74,223.33
		% change		55.0%	5.3%	1.4%	4.0%	2.4%	3.1%	5.6%	3.2%	2.9%	3.1%

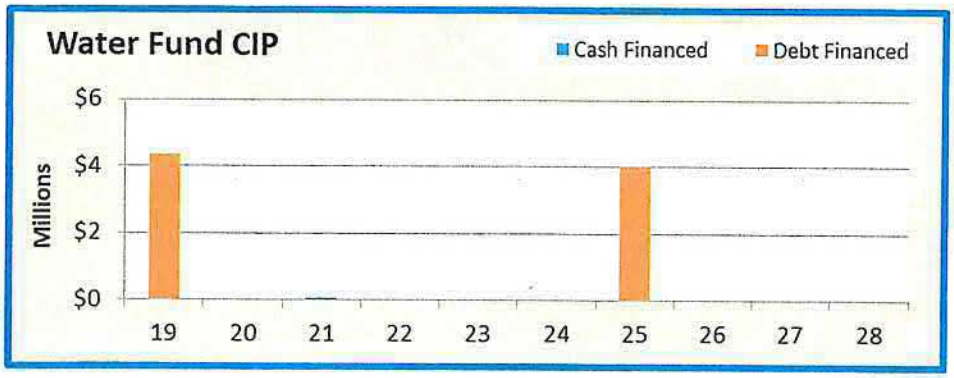
However, due to proposed changes to the City's sewer rate structure, the overall impact on the largest customer is expected to be much less severe:



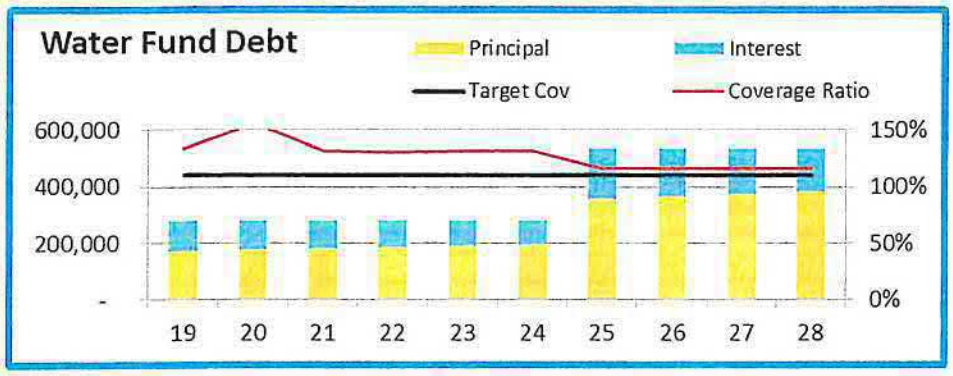
The rates above are expected to be sufficient to meet the revenue needs of the Water Fund and avoid any gap in funding, as illustrated in revenue and expense comparison chart below:



Based on the capital projects identified in the City's Water AMP, the City anticipates two bond issues over the next ten years, along with a minimal amount of capital funding from cash:



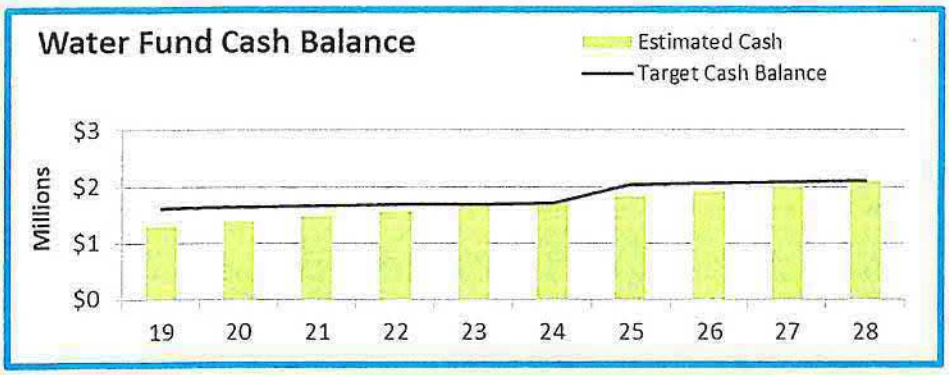
The debt service associated with the above bond issues, as well as the estimated bond coverage ratios, are illustrated here:



The forecasted cash balance in the Water Fund is summarized in the following chart. The difference between estimated cash balances and target cash balances is not significant. As part of our rate analysis, we are recommending the City consider 4 separate cash reserves:

- 90 days O&M expenses
- 125% of annual debt service requirements
- 10% of replacement value of water assets
- Customer deposits

The difference between estimated and target cash is well within the O&M reserve amount, which simply means the City should be able to meet it obligated reserves, but may fall a little short in the O&M reserve. Raising rates to cover this gap is warranted at this time.



Smart Management for Small Water Systems

EFCN environmental finance center network

CERTIFICATE OF ATTENDANCE

Keith Risdon

completed 1 hour of webinar training for

Pricing Water for Conservation—How Different Rate Structure Impact Different Customers

Feb 25, 2019

Hosted by the Environmental Finance Center Network

Glenn Barnes, Associate Director, UNC EFC	Feb. 25, 2019	Glenn Barnes
Presenter Name, Title, Organization	Date	Signature

For attendance verification, please contact smallsystems@syr.edu

CAPITAL IMPROVEMENTS

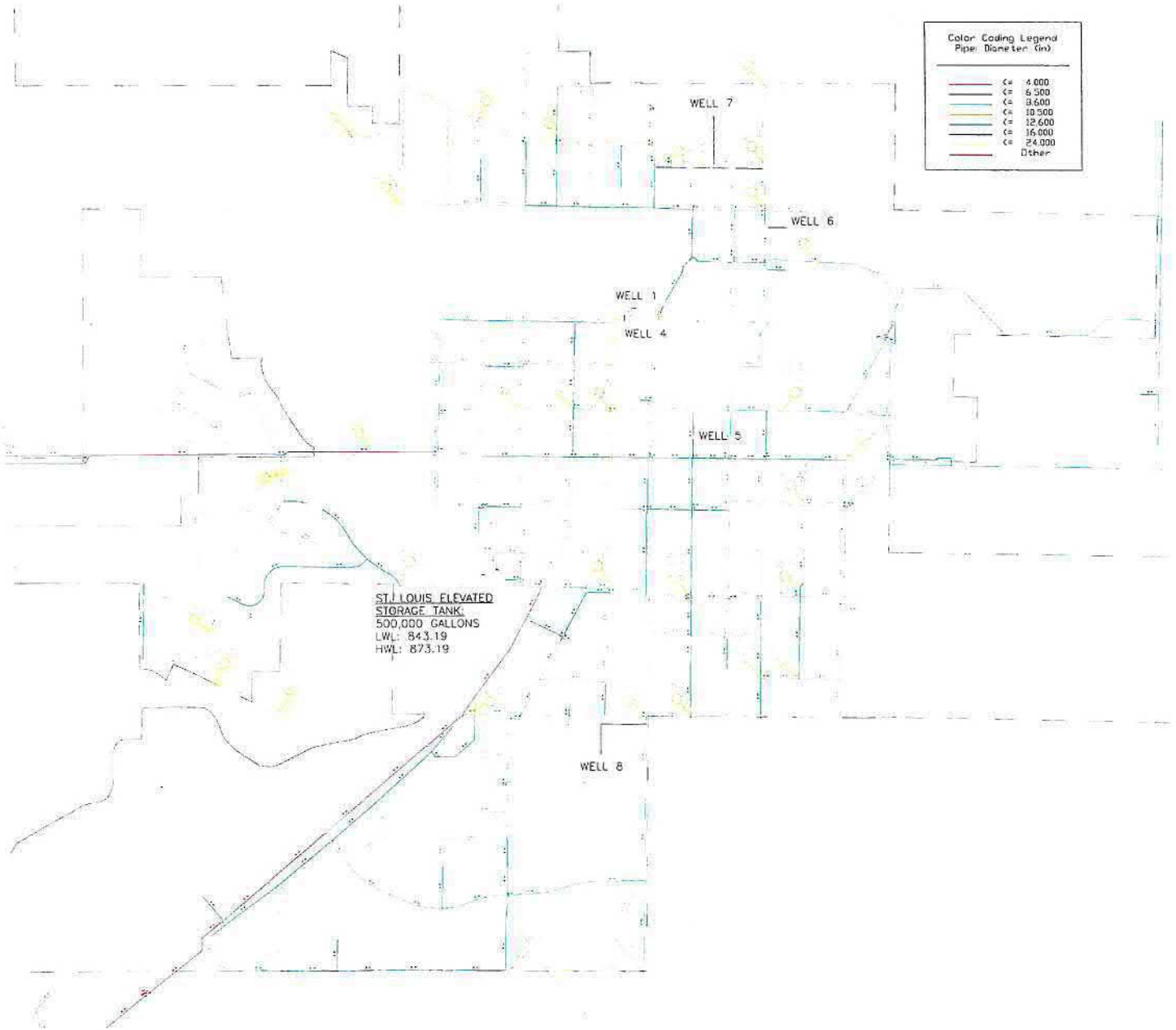
FISCAL YEARS 19/20, 20/21, 21/22

			DESIGN	CONSTRUCTION		Fiscal Year
	Maple Street Reconstruction					
S.S.		Sanitary Sewer		$451,000		19/20
WM		Water Main		$320,000		19/20
DPW		Paving, Curb & Gutter, Sidewalks, Storm Sewer		$514,000	($264,000 DPW Roads Funds & $250,000 MDOT Cat B)	19/20
S.S.	New Pump Stations, Equal. Basin, Force Main, Sewer Lines, etc.		$200,000			19/20
				$4,450,000	(New pump station & Eq. Basin)	21/22
				$365,000	((Union St. P.S. Upgrade)	23/24
				$300,000	(New River Court Sewer)	24/25
S.S.	Michigan Ave Pump Station		$35,000			19/20
				$450,000		20/21
WM	Berea Street Water Main (Prospect St. to Tamarack St.)		$25,000			19/20
				$322,000		19/20
S.S.	Center Street Sanitary Trunkline (Mill St. to Pine St.)		$20,000			20/21
				$160,000		21/22
WM	N. Pine Street Sanitary Sewer (Center St. to M-46)		$28,000			20/21
				$310,000		21/22
WM	Washington (M-46) WM Extension (Watson St. to Pine St.)		$48,000			20/21
				$400,000		21/22
WM	W. State St R.R. Crossing WM (Michigan Ave. to Wilson Blvd.		$18,000			20/21
				$75,000		21/22
WM	Crawford WM Extension (Michigan Ave. to Mill St. -eas'm't.)		$10,000			21/22
				$88,000		21/22
DPW	State St. Reconstruction (Wilson Blvd to S. Main St.)		$80,000			20/21
		Sanitary Sewer		$95,000		21/22
		Water Main		$50,000		21/22
		Paving, Curb & Gutter, Storm Sewers, Sidewalks		$750,000	($375,000 DPW Road Funds & $375,000 MDOT Small Urban)	21/22
DPW	Main St Bridge Re-Habilitation					
		Scour Resistance	$75,000			20/21

BUDGET

FY	Sanitary	Water Main	DPW/Roads	Design	Electric
19/20	$451,000	$642,000	$264,000	$260,000	
20/21	$645,000			$314,000	$200,000
21/22	$5,067,000	$613,000	$875,000	$165,000	
22/23		$880,000		$123,000	
23/24	$365,000	$400,000	$42,500		
24/25	$300,000			$75,000	
25/26	$705,000			$85,000	
26/27	$855,000			$55,000	
27/28	$525,000				

				$500,000		21/22
		Structure & Deck Rehab	$75,000			22/23
				$850,000	(95% Fed & MDOT)	23/24
DPW	Prison Pump Station Reconstruct		$75,000			23/24
				$1,100,000	(MDOC funds)	24/25
DPW	Devon St. Flowmeter Rebuild		$7,000	$52,000		21/22
S.S.	E. Saginaw San. Sewer Reconst.		$45,000	$195,000		20/21
WM	Prospect St WM (Corinth St. to Hebron St.)		$48,000	$220,000		21/22 22/23
WM	Hebron St WM (Prospect St. to Olive/Madison St.)		$52,000	$260,000		21/22 22/23
S.S.	Franklin St. Reconst San. Sewer (Saginaw St. to Walnut St.)		$75,000	$705,000		24/25 25/26
S.S.	Clinton St Reconst San. Sewer (Saginaw St. to Butternut)		$85,000	$855,000		25/26 26/27
S.S.	North St. Reconst San. Sewer (Watson St. to Mill St.)		$55,000	$525,000		26/27 27/28
Electric	Prospect Power Line - EPA			$200,000		20/21
WM	Washington (M-46) WM Extension (Pine St to Clinton St)		$48,000	$400,000		21/22 22/23
WM	Washington (M-46) WM Extension (Clinton St to Hubbard St.)		$48,000	$400,000		22/23 23/24


Color Coding Legend
Pipe Diameter (in)
<= 4.000
<= 6.500
<= 8.600
<= 10.300
<= 12.600
<= 16.000
<= 24.000
Other
WELL 7
WELL 6
WELL 1
WELL 4
WELL 5
WELL 8
ST. LOUIS ELEVATED
STORAGE TANK:
500,000 GALLONS
LWL: 843.19
HWL: 873.19

APPENDIX C

PROJECT ESTIMATE OF COST

PRELIMINARY ESTIMATE OF COST

LEAD SERVICE IDENTIFICATION, REMOVAL, AND REPLACEMENT

CITY OF ST. LOUIS
GRATIOT COUNTY, MICHIGAN

Item No.	Estimated Quantity	Unit	Description	Unit Price	Amount
DIVISION A - Identification/Verification of Service Materials					
1.	1000	Each	Hydroexcavate and Identify Service	$750.00	$750,000.00
Sub-Total - Construction Costs Division "A"					$750,000.00
DIVISION "B" - Replacement of Water Services					
2.	600	Each	Remove and replace lead services	$500.00	$300,000.00
3.	600	Each	Curb Stop and Box	$500.00	$300,000.00
4.	600	Each	Corporation and Saddle	$1,000.00	$600,000.00
5.	600	Each	Reconnect to existing residential water meters	$2,400.00	$1,440,000.00
6.	600	Each	Abandon water service at existing water main	$100.00	$60,000.00
7.	600	Each	Cleanup and restoration	$500.00	$300,000.00
Sub-Total - Construction Costs - Division "B"					$3,000,000.00
Sub-Total - Construction Cost - Divisions "A" and "B"					**$3,750,000.00**
Preparation of DWRF Project Plan					$40,000.00
Engineering					$150,000.00
Construction Administration, Staking and Inspection					$450,000.00
Material Testing					$25,000.00
Legal/Admin/Bonding					$85,000.00
Contingencies					$400,000.00
TOTAL PRELIMINARY ESTIMATE OF COST					$4,900,000.00

Present Worth Analysis and Cost Breakdown

Community Name: **CITY OF ST. LOUIS**

Federal Discount Rate for Water Resources Planning (Interest Rate) i = -0.005
Number of Years, n = 20 years

Recommended Alternatives:			
Alternative 1: **Water System Improvements**		**Alternative 2:** **Water System Improvements w/ Principal Forvgiveness**	
Initial Capital Costs =	$4,900,000	**Initial Capital Costs =**	$1,900,000
Annual Operations & Maintenance Costs =	$1,738,537	**Annual Operations & Maintenance Costs =**	$1,738,537
Future Salvage Value =	$5,000	**Future Salvage Value =**	$5,000
Present Worth of 20 years of O & M =	$36,665,109	**Present Worth of 20 years of O & M =**	$36,665,109
Present Worth of 20 yr Salvage Value =	$5,527	**Present Worth of 20 yr Salvage Value =**	$5,527
Total Present Worth =	$41,559,582	**Total Present Worth =**	$38,559,582
Number of REU's =	3589	**Number of REU's =**	3589
Estimated Interest Rate =	1.875%	**Estimated Interest Rate =**	1.875%
Principal Loan Amount =	$4,900,000	**Principal Loan Amount =**	$1,900,000
Estimated Loan Duration (Years) =	20	**Estimated Loan Duration (Years) =**	20
Estimated Yearly Payment	($296,065.25)	**Estimated Yearly Payment**	($114,800.81)
Esimated Quarterly Payment Per REU	$ (20.62)	**Esimated Quarterly Payment Per REU**	$ (8.00)

APPENDIX D

DISADVANTAGED COMMUNITY WORKSHEET

Disadvantaged Community Status Determination Worksheet

The following data is required from each municipality in order to assess the disadvantaged community status. Please provide the necessary information and return to:

Robert Schneider
Revolving Loan Section
Drinking Water and Municipal Assistance Division
P.O. Box 30817
Lansing, MI 48909-8311
Schneiderr@michigan.gov

If you have any questions please contact Robert Schneider at 517-388-6466

Please check the box this determination is for:

☒ DWRF ☐ SRF

1. Total amount of anticipated debt for the proposed project, if applicable.

   $4,000,000

2. Annual payments on the existing debt for the system.

   2020 Series Bonds - Annual payments including interest range $66,875 to $78,440

3. Total operation, maintenance and replacement expenses for the system on an annual basis.

   Annual water operation, maintenance, including depreciation for YearEnd 2020 was $1,738,537

4. Number of "residential equivalent users" in the system.

   3589

For determinations made using anticipated debt, a final determination will be made based upon the awarded loan amount.

APPENDIX E

PUBLIC HEARING INFORMATION