DRAFT
City of St. Louis

FY 2024 Clean Water State Revolving Fund
Project Planning Document

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ABBREVIATIONS

City – City of St. Louis

CWSRF – Clean Water State Revolving Fund

DDT – Dichlorodiphenyltrichloroethane

DIP - Ductile Iron Pipe

EGLE – Michigan Department of Environment, Great Lakes, and Energy

GPM - Gallons per minute

I/I – Inflow and Infiltration

MDNR – Michigan Department of Natural Resources

MDOC – Michigan Department of Corrections

MGD – Million Gallons per Day

MNFI – Michigan Natural Features Inventory

NAAQS – National Ambient Air Quality Standards

NREPA – Natural Resources and Environmental Protection Act (Act 451 of 1994)

O&M – Operation and Maintenance

PS – Pump Station

RAS - Returned Activated Sludge

RBC – Rotating Biological Contractor

SAW - Stormwater, Asset Management, and Wastewater

SSO – Sanitary Sewer Overflow

TDH – Total Dynamic Head

VCP – Vitrified Clay Pipe

VFD – Variable Frequency Drive

WAS - Waste Activated Sludge

WWTP – Wastewater Treatment Plant

1. INTRODUCTION

The City of St Louis is submitting this Project Planning Document to apply for a Clean Water State Revolving Fund (CWSRF) low interest loan to address needed improvements to its sanitary sewer system. The proposed improvements include the reconstruction of sewer along Main, Saginaw, and River Court, improvements to the Union Street Pump Station (PS), and the construction of a force main from Union Street PS to the Wastewater Treatment Plant (WWTP). Old sewers will be abandoned where no longer needed and where new sewer is proposed. The City's sewage is discharged to the WWTP located at the east intersection of Union Street and Prospect Street.

Improvements to the City's collection system and Union Street Pump Station are needed to accommodate current flows. In addition, the WWTP improvements to the grit removal, bioselector, oxidation ditches, final settling, disinfection, and sludge handling processes are needed to achieve compliance with design guidelines contained within Ten State Standards and keep the facility running properly and efficiently. The Project Planning document has been developed using the Michigan Department of Environment, Great Lakes, and Energy (EGLE), CWSRF Project Planning Guidance Document released in January 2023.

An Intent to Apply was submitted to EGLE on October 27, 2022. The Intent to Apply form included a description of the proposed projects and preliminary costs. On November 29, 2022, a multi-jurisdictional webinar was held by EGLE while virtual office hours were held on December 6, 2022, and December 8, 2022, to ask questions about this project and to seek clarification regarding the required level of detail for this Project Planning Document submission.

2. BACKGROUND

2.1 STUDY AND SERVICE AREAS

The City of St. Louis is a 3.53 square mile community located in north-central Gratiot County. The City is surrounded by Bethany Township and Pine River Township. St. Louis borders the City of Alma along US-127 and M-46 passes through the center of St. Louis as its principal commercial corridor.

The service area includes the City of St. Louis, as well as a small portion of Bethany Township along M-46 and Croswell Road, and properties in Pine River Township along M-46 and a short section of Alger Road. The study area is limited to the City's jurisdictional limits. Figure 2-1 presents a map of the existing service area.

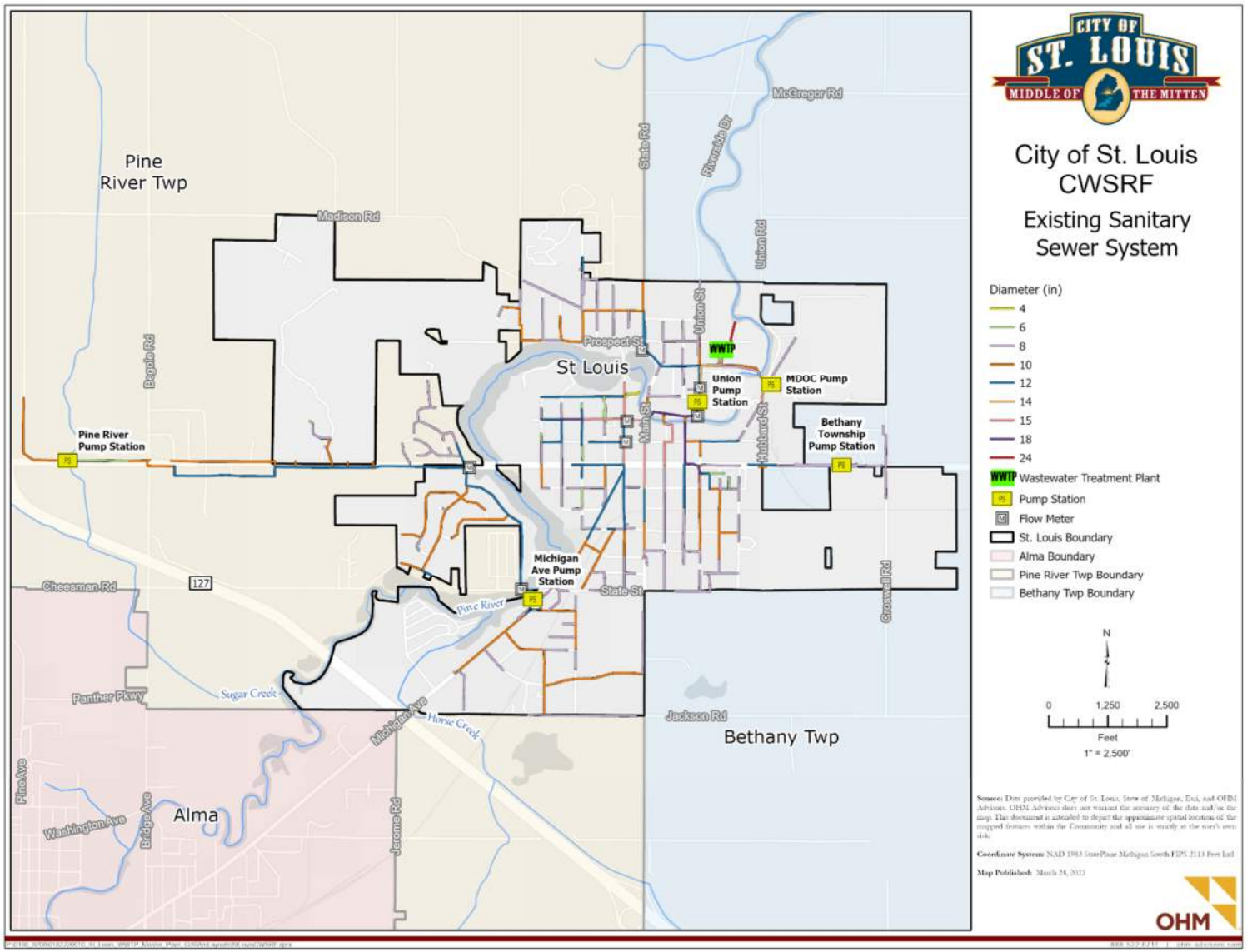


Figure 2-1: Existing Service Area

2.2 POPULATION

The City of St. Louis' residential population was 7,010 as of April 2020. According to Michigan Labor Market Information, Gratiot County's population is projected to decrease by approximately 0.37% per year. The City's population was predicted to be about 6,439 in 2043 based on the Gratiot County projections. There is no substantial seasonal variation in population within the City of St. Louis. Table 2-1 displays the population data for the City of St. Louis.

Table 2-1 Present and Future Population Projection for the City of St. Louis

Population	2020 Census	Projected Gratiot County Change per Year	Extrapolated 2043 Projections
Total Population	7,010	-0.37%	6,439

Source: www.census.gov and www.milmi.org accessed on 3/10/2023

2.3 EXISTING ENVIRONMENT EVALUATION

2.3.1 Cultural and Historic Resources

The City of St. Louis contains the St. Louis Downtown Historic District, which is primarily made up of commercial structures. In this district, there are buildings that were constructed as early as the 1870s. Historic landmark locations are shown in Figure 2-2 on page 5.

2.3.2 Air Quality

According to the 2021 Michigan Air Quality Annual Report, the area is in compliance with the National Ambient Air Quality Standards (NAAQS) for carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide.

2.3.3 Wetlands

As shown in Figure 2-2, wetlands exist in portions of the City of St. Louis. The wetlands are predominantly found in a circular ring, with a few wetlands located along the Pine River. Wetlands are regulated by the State of Michigan under Part 303 of the Natural Resources and Environmental Protection Act (Act 451 of 1994 or NREPA).

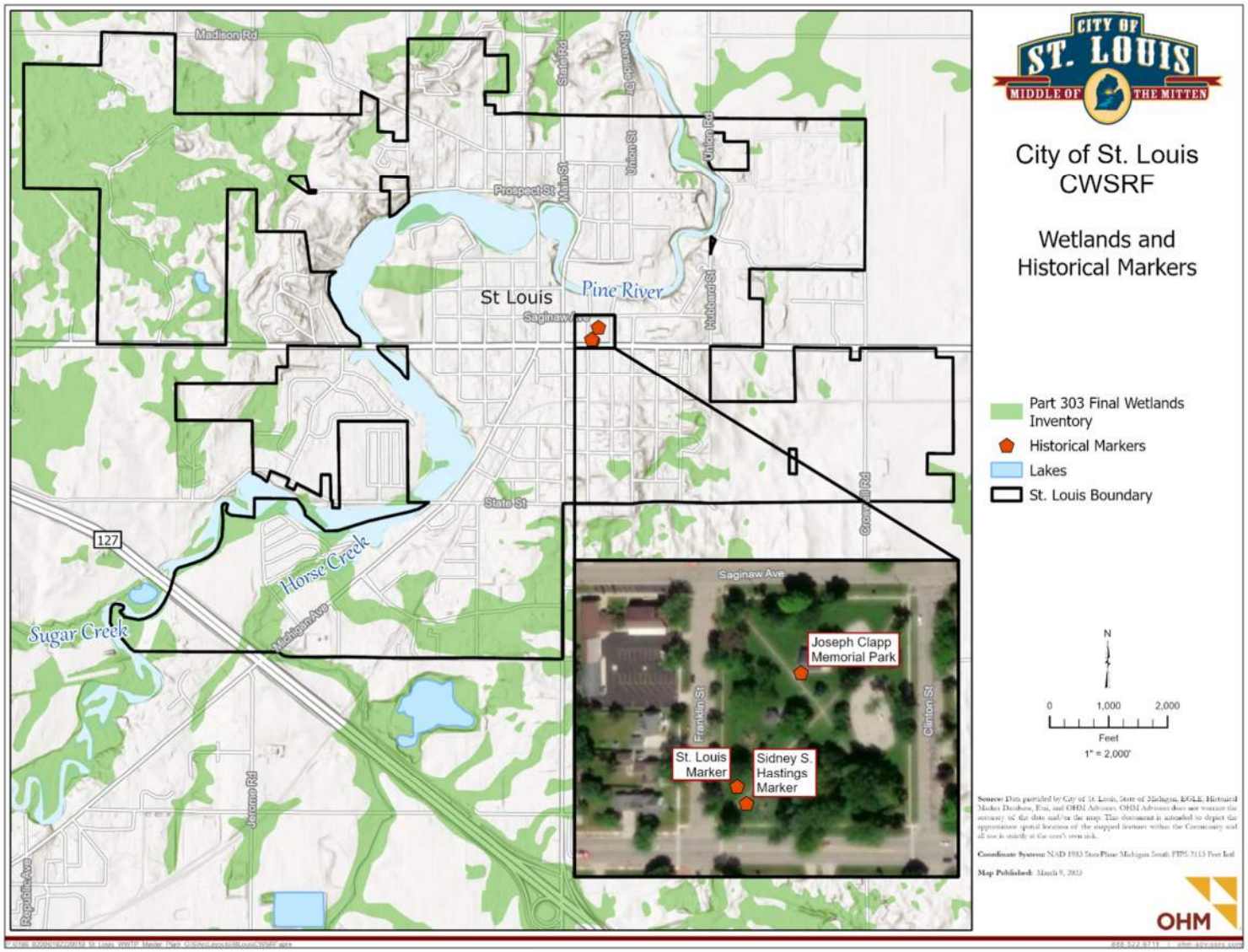


Figure 2-2: Wetlands in St. Louis

2.3.4 Great Lakes Shorelands, Coastal Zones, and Coastal Management Areas

There are no coastal zones within the study area.

2.3.5 Floodplains

Along the Pine River, there are several areas designated as within the 100-year floodplain. A map of the 100-year floodplain can be found in Figure 2-3.

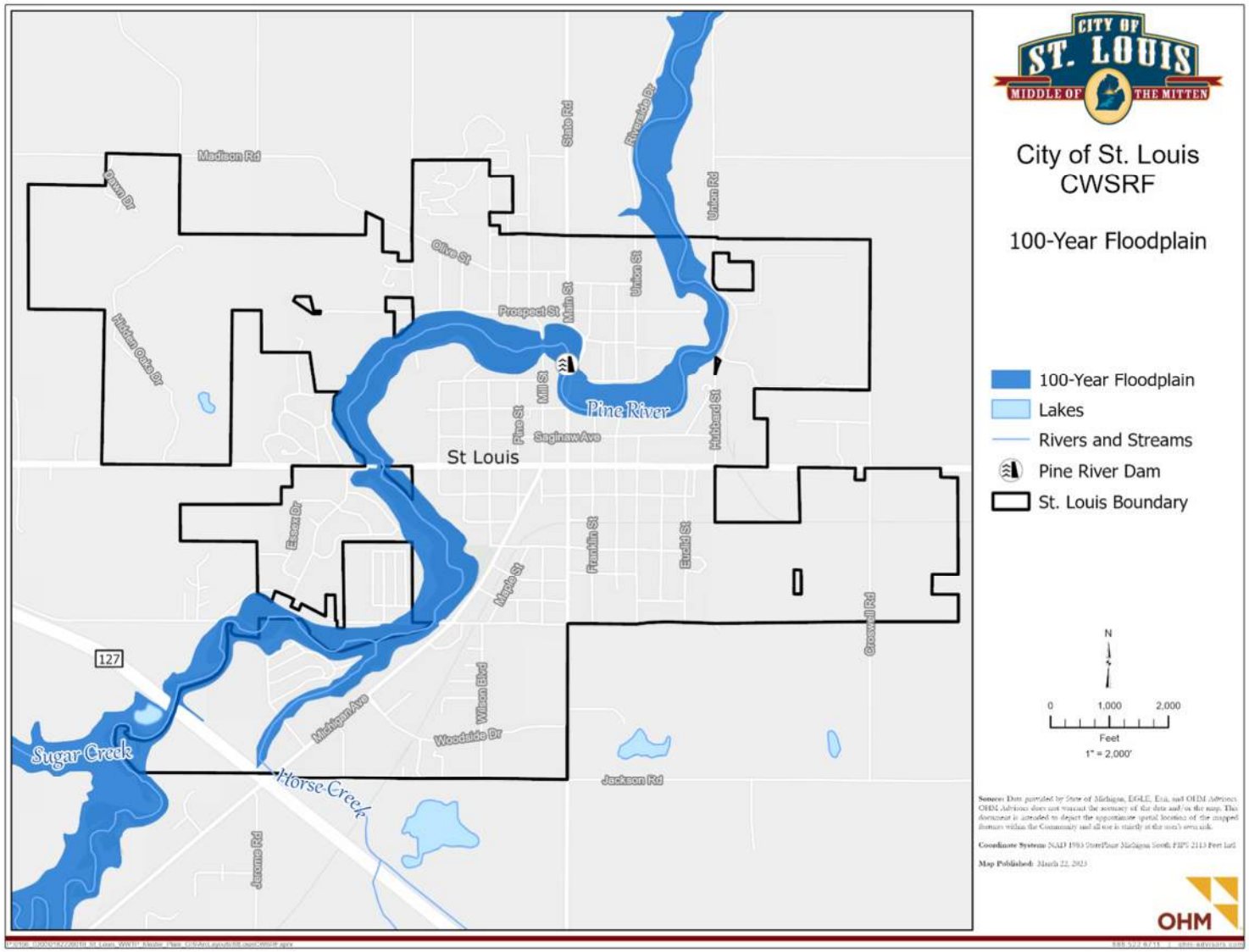


Figure 2-3: 100-Year Floodplain in St. Louis

2.3.6 Natural or Wild and Scenic Rivers

There are no Natural Rivers as designated by the Michigan Department of Natural Resources (MDNR) or Wild and Scenic Rivers as designated by the National Wild and Scenic Rivers System in St. Louis, Michigan.

2.3.7 Major Surface Waters

The Pine River is within the study area and is a part of the Upper Pine River Watershed, which eventually flows into Lake Huron. On the Pine River, there is a dam located near the W.T. Morris Memorial Park between North Mill Street and North Main Street in St. Louis. The Pine River is being treated due to the dichlorodiphenyltrichloroethane (DDT) contamination present in the river and the former Michigan Chemical and Velsicol Chemical plant site. DDT levels have reduced significantly in fish from the river, but an advisory remains in place. No other major surface waters are present within the project area.

2.3.8 Topography

The terrain in the study area does not vary significantly. The banks of the Pine River are the only substantial slopes within the study area. There are several small hills throughout St. Louis, while the remaining area is predominantly a flat plain. Figure 2-4 presents a topographic map of the study area.

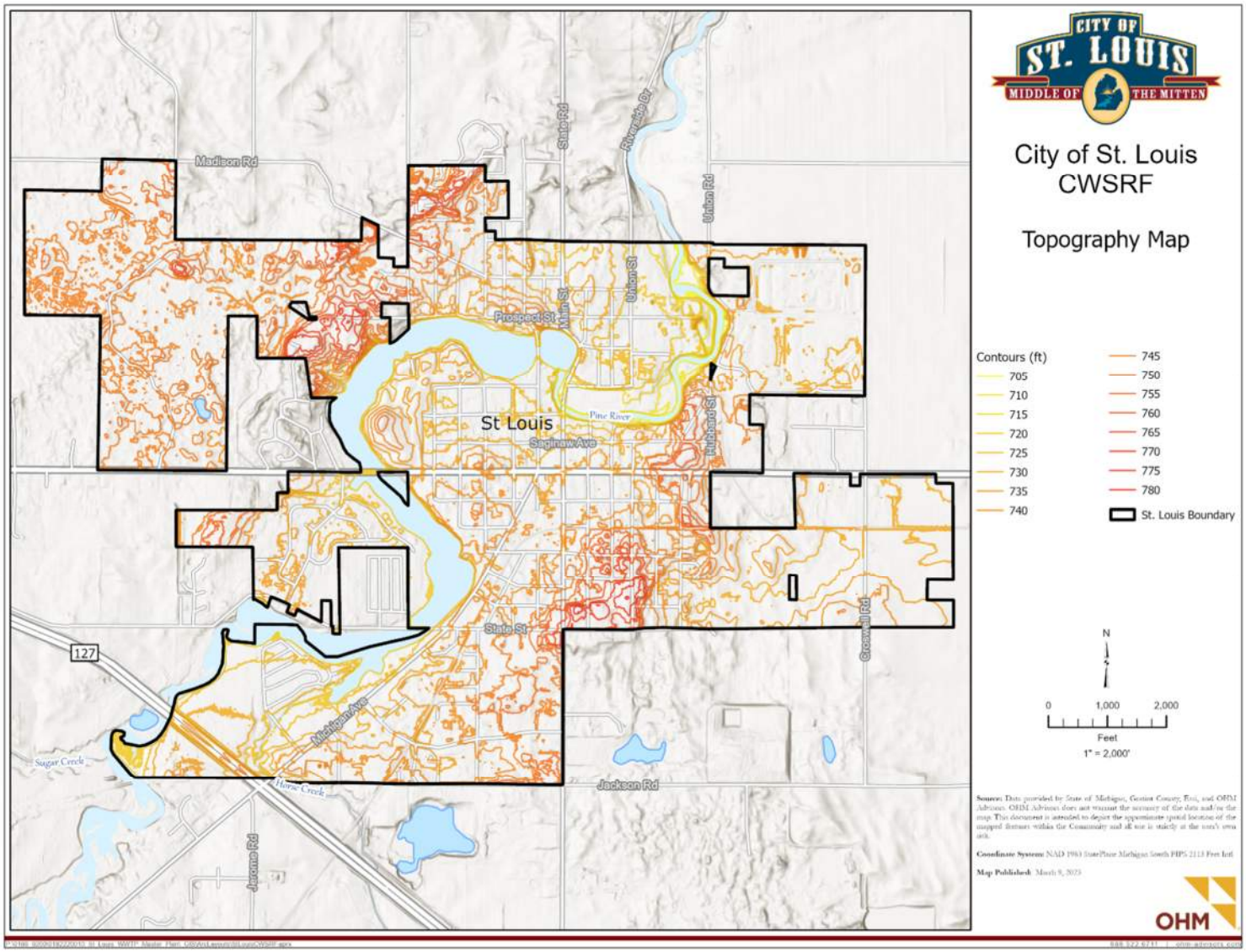


Figure 2-4: Topography in St. Louis

2.3.9 Geology

The bedrock geology of the City of St. Louis is comprised of Red Beds and Saginaw Formation. The quaternary geology consists of lacustrine clay and silt and end moraines of medium-textured fill.

2.3.10 Soil Types

Figure 2-5 presents a summary of the type of soils found in the City of St. Louis, which are mainly moderately to poorly draining soils. These soils include loam, loamy sand, muck, peat, marl, pits, quarries, mines, sand, and sandy loam.

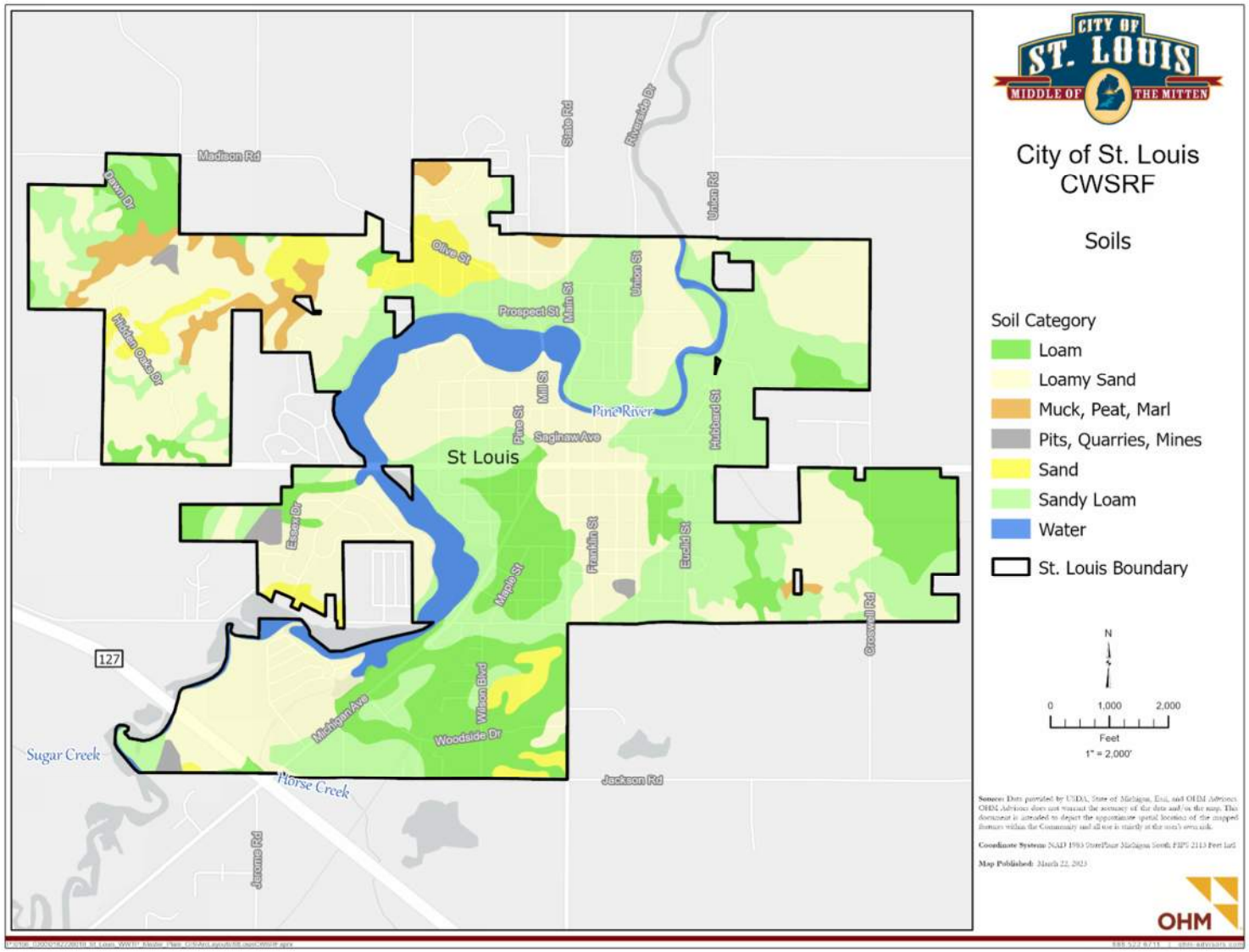


Figure 2-5: Soil Types in St. Louis

2.3.11 Agricultural Resources

Throughout Gratiot County, approximately 80% of land is dedicated to farms, producing corn, wheat, sugar beets, beans, and livestock. There is no agricultural land in the City of St. Louis and the service area does not extend into agriculturally zoned land in Bethany or Pine River Townships.

2.3.12 Fauna and Flora

After reviewing the Threatened and Endangered Species list generated by the Michigan Natural Feature Inventory (MNFI) Web Database, one State threatened, endangered, or species of special concern has been documented within 1.5 miles of the project area. This species is the Black Redhorse, which is classified as a species of special concern, was last observed within 1.5 miles of the project area in 1921. The United Stated Fish and Wildlife Service (USFWS) noted that there were six threatened and endangered species that may be present within 1.5 miles of the project area.

2.4 EXISTING SYSTEM

The City of St. Louis is served by a collection system, which is a combination of gravity sewers and force main. Figure 2-1 displays five pumpstations. Pine River Township, Bethany Township and the Michigan Department of Corrections (MDOC) operate their own pump stations. The City of St. Louis operates and maintains the Michigan Avenue and Union Street Pump Stations. The Michigan Avenue Pump Station is located at the intersection of Michigan Avenue and Whitney Place. The Union Street Pump Station is located east of the football field on Union Street, south of River Court. The St. Louis WWTP is located on the east side of the intersection of Union Street and Prospect Street.

2.4.1 Collection System

The City of St Louis sewer system has 21 miles of gravity sanitary sewer ranging from 4 to 24 inches in diameter, one mile of sanitary sewer force main ranging from 6 to 14 inches in diameter, 441 manholes, and five pump stations. The City owns the Michigan Avenue and Union Street Pump Stations. The wastewater is directed to the Union Street Pump Station where it is transferred to the St. Louis WWTP via force main.

2.4.2 Michigan Avenue Pump Station

The pump station is located at the intersection of Michigan Avenue and Whitney Place. It was originally constructed in 1968 and improvements were made in 1996. The improvements included pump replacement, installation of bypass pump connection, and re-routing of the force main discharge point from Michigan to Chestnut and Maple Street. A new force main was installed in 2016, re-routing the outlet to the manhole at Michigan and Locusts Streets. The Michigan Avenue Pump Station was replaced in 2021. The current pump station consists of a submersible duplex sanitary pump station with the rated capacity of 600 gpm at 55' Total Dynamic Head (TDH). The influent pipe was replaced and approximately 65 linear feet of 8-inch force main was installed. The pump station flow discharges into a 1,354 foot long 8-inch ductile iron pipe (DIP). This flow ultimately passes through the Union Street Pump Station.

2.4.3 Union Street Pump Station

The existing Union Street Pump Station structure was constructed in 1954 when the original WWTP was constructed. The three pumps were replaced in 1999. At present, flow enters a wet well by gravity from the City's sewer system through an 18-inch and 12-inch vitrified clay pipe (VCP) forcemain. Three dry pit submersible pumps, each rated at 40 hp, pump flow from the wet well and discharge to the WWTP through a 14-inch ductile iron force main installed in 1999. Two of the three pumps are equipped with variable frequency drives (VFDs). The two pumps equipped with variable frequency

drives are rated for 800 to 1,600 gpm and the other pump that is constant speed is rated for 1,600 gpm. The firm capacity of the pump station is 3,200 gpm or 4.6 MGD.

2.4.4 WWTP

The St. Louis WWTP was constructed in 1954 and is located at the corner of Union Street and East Prospect Street. This WWTP has undergone several improvements over the years. The average day design capacity of the WWTP is 1.6 MGD and the peak hour capacity is approximately 4.6 MGD. The WWTP was upgraded to use rotating biological contractors (RBCs) and settling tanks for the biological treatment in 1999. The peak flow for the RBC WWTP system was 5.0 MGD. However, in 2013 the RBC biological system was converted to address more restrictive phosphorus National Pollutant Discharge Elimination System (NPDES) permit. The preliminary treatment is provided by a new fine screen and a vortex grit system. The wastewater then enters a selector tank to promote biological phosphorus removal prior to entering the oxidation ditch. The mixed liquor from the oxidation ditches is settled in secondary clarifiers prior to disinfection using chlorine gas. Solids from the secondary clarifier enter an anaerobic digester. The digested sludge is then stored prior to land application.

2.5 NEED FOR THE PROJECT

The City of St. Louis' sanitary sewer system has been studied since 2005 with upgrades to the sanitary sewer collection system and WWTP based on the recommendations from the 2005 Study and the recent 2017 Stormwater, Asset Management and Wastewater (SAW) Grant Study. The City still occasionally experiences sanitary sewer overflows (SSOs) during large rain events. Several of these SSO events have occurred in the past five years and were classified as bypass overflows. Typically, the SSOs are occurring near Main Street, north of Pine River as the sewer surcharges in this vicinity, resulting in sewer overflows to the Pine River within the City. A summary of the SSOs in the past five years is presented in Table 2-2.

Table 2-2 Sanitary Sewer Overflows

Date	Estimated Release Volume (gallons)
10/2/2019	100,000
12/30/2019	100,000
5/18/2020	40

An evaluation of the sewer system and WWTP was performed to review alternatives for addressing the SSOs in 2021. The alternatives focused on collection system improvements to increase the transport capacity to the WWTP and improvements at the WTTP to increase the peak hourly flow capacity. The capacity of existing piping was reviewed, and alternatives were developed to transport the peak flow of 7.0 MGD to the WWTP.

The piping that crosses the Pine River and currently transports the wastewater to the Union Street Pump Station was televised and was rated as 4s using the NASSCO PACP scoring criteria. Figure 2-6 presents a map of the ratings within the project area.

Figure 2-6: Project Area PACP Ratings in St. Louis

The WWTP has experienced several operational challenges that could be addressed by increasing the peak hourly design flow to 7.0 MGD from the 4.6 MGD currently.

2.5.1 Grit Removal

The installed grit system was replaced in 1999. At present, flow passes by gravity through a channel from the screening building to a single vortex grit unit. A bypass is available around the unit. From the unit, flows discharges to the Primary Clarifier splitter box.

Grit is removed using an air lift pump which sits on top of the vortex unit. Grit is deposited inside the screening building in a dumpster. The grit removal system is designed for a peak hourly flow of 4.6 MGD.

2.5.2 Activated Sludge System

At present, the selector tank only provides 1 hour of detention time. In addition, there is no baffling in the selector tank, which is designed for biological phosphorus removal so flows can potentially short-circuit in this structure. Design guidelines suggest having two hours of detention time and installing baffles to promote anaerobic conditions in the selector tank, which promotes growth of phosphorous accumulating organisms that allow the process to function. Biological phosphorus removal is difficult to maintain, particularly during wet weather events when the detention times are lowest. The outlet from the selector tank discharges to the oxidation ditches, where the flow is split between the 2 ditches. The existing flow split uses a tee, so confidence in both ditches receiving equal flow is low.

2.5.3 Secondary Clarifiers

At present, flow passes by gravity to a splitter box that splits the flow equally between the newer tank 3 and the two older tanks 1 and 2. The flow splitting between the two older tanks uses a tee, so confidence in the older tanks receiving equal flow and all 3 tanks running at similar process parameters is low. In addition, tanks 1 and 2 were designed and constructed to follow the RBCs, which is an attached growth process, which has been replaced by an oxidation ditch, which is a suspended growth process. The older clarifiers have a lower sidewater depth than recommended by Ten State Standards, as attached growth was easier to settle than the current mixed liquor suspended solids. Solids discharge to the Process Building and are pumped either to sludge storage (waste activated sludge or WAS) or returned to the Oxidation Ditches (return activated sludge or RAS).

2.5.4 Disinfection

Disinfection is provided by the addition of chlorine gas to a chlorine contact tank that is located below the Process Building. Controls for the system are in a room within the building. Chlorine gas presents a health and safety hazard to WWTP employees.

Final clarifier effluent flows via gravity to the Process Building and passes through the contact tank. The contact tank is below grade and is baffled. Volume of the contact tank is roughly 39,000 gallons, which at average daily flow of 1.6 MGD provides about 35 minutes of detention. The detention time for the current peak of 4.6 MGD is approximately 12 minutes. The current peak hourly flow does not meet the Ten State Standards detention time requirements of 15 minutes.

2.5.5 Solids Handling

At present, WAS is pumped into an anaerobic digester. Digested sludge is pumped for storage in either a below-ground storage tank or a converted digester. The digester and below ground storage were

constructed in 1999; the above-ground tank was constructed in 1981, making it over 40 years old. The original digester, now used for storage, was constructed in 1954. Due to changes in weather patterns, it has been difficult to find farm fields that are willing to accept land applications in the spring, as farmers are focused on getting crops planted in the field. Instead of land application occurring twice per year, the St. Louis WWTP is required to hold solids for a full year. The WWTP does not have any mechanical thickening processes, relying on gravity thickening and decanting from the top of the sludge storage tanks. The land application contractors currently bring thickeners to be used as they pump the biosolids out of the holding tanks.

2.6 PROJECTED FUTURE NEED

The population is anticipated to decrease slightly over the next 20 years, so additional connections are not planned during this time. Climate change is being observed in Michigan in terms of increased precipitation rates and overall volumes. This could lead to larger floodplains, as well as more frequent and larger SSOs into the Pine River. By decommissioning pipe in poor condition in the vicinity of the Pine River, it decreases the likelihood of increased inflow and infiltration in the future. According to St. Louis' Capital Improvement Plan, the City plans to upgrade many sections of its sanitary sewer from 2023 through 2038 in order to improve its overall sanitary sewer system.

Some of the assets at the WWTP were rehabilitated or installed during the 2013 conversion of the secondary treatment system. In 20 years, some of these assets will be approaching the end of their useful life. Other assets that require rehabilitation and replacement will include the anaerobic digesters and control equipment. Some of the original tanks and structures were constructed in 1954 and are approaching 70 years in age. Rehabilitation of these tanks and structures will be necessary to maintain their structural integrity and usefulness.

3. ANALYSIS OF ALTERNATIVES

The projects were divided into collection system improvements, pump station improvements, and WWTP improvements.

3.1 NO-ACTION

The first alternative to consider is no-action. It must be determined that no project is viable for the community to select for this alternative. The existing infrastructure is experiencing SSOs and causing flooding of the high school athletic fields. Some of the assets at the WWTP do not meet current design standards. For example, the secondary clarifiers are shallower than recommended by Ten State Standards and the chlorine contact tank does not have sufficient contact time during peak hour events. This could result in suboptimal treatment of wastewater discharged to the Pine River. The no-action alternative will not be pursued because it will not address the issues that need to be corrected and will not lead to improved condition of the existing sanitary sewer system, Union Street Pump Station, and WWTP, or protection of public health.

3.2 OPTIMUM PERFORMANCE OF EXISTING FACILITIES

The second alternative is to consider optimization of the existing system. The City has done a lot of work at the WWTP to optimize treatment during peak flow periods, but the processes are not designed to receive the flows. Optimizing the performance of the existing facilities will not reduce the number of SSO events, which results in sewage spillage that could pose potential threat to public health, therefore this alternative will not be pursued.

3.3 REGIONALIZATION

The third alternative is to consider a regional treatment alternative. The City of Alma is southwest of the City of St. Louis and has its own collection system and WWTP. However, the Alma WWTP does not have sufficient capacity to accommodate the St. Louis flows and significant expansion would be needed if the alternative were pursued. There are no other regional alternatives available. Therefore, the regional alternative will not be explored further.

3.4 PRINCIPAL ALTERNATIVES

The principal alternatives included methods for the collection system and improvements required at the Union Street Pump Station to transport a peak hourly flow of 7.0 MGD. In addition, improvements at the St. Louis WWTP to improve operations and treat 7.0 MGD are also proposed.

3.4.1 Collection System & Pump Station Improvements

- Alternative 1: The proposed sewer route is shown in *Figure 3-1*. Wastewater flows west along Saginaw Avenue from Clinton Street to Main Street, then north along Main Street from Saginaw Street to Center Street. The sewer would then continue north, flowing under the Pine River, which would be installed using jack and bore. The sewer would, then follow along the west side of the St. Louis High School athletic field via gravity sewer where it connects to River Court. The wastewater would flow east on River Court from Main Street to the Union Street Pump Station. The existing pumps in the Union Street Pump Station would be removed and replaced with five, 1,200 gpm units. The building would need to be expanded in order to accommodate the pumps. The proposed pumps would provide a firm capacity of 7.0 MGD and allow both average daily flows and peak hourly flows to be accommodated. A new forcemain would connect the Union Pump Station to the WWTP.

Figure 3-1: Alternative 1 Collection System Layout

- Alternative 2: The proposed sewer route is shown in Figure 3-2. The route would follow a similar route, west along Saginaw Avenue from Clinton Street to Main Street, then North along Main Street from Saginaw Avenue to Center Street. After flowing north under the Pine Rive, a new pump station would be constructed. A new force main would flow in a northerly direction from the new pump station along the west side of the St. Louis High School athletic field to River Court. The force main would continue east in River Court from Main Street to the Union Street Pump Station. The existing pumps in the Union Street Pump Station would be removed and replaced with five, 1,200 gpm units. The building would need to be expanded in order to accommodate the pumps. The proposed pumps would provide a firm capacity of 7.0 MGD and allow both average daily flows and peak hourly flows to be accommodated. A new forcemain would transfer the wastewater to the St. Louis WWTP.

Figure 3-2: Alternative 2 Collection System Layout

3.4.2 Secondary Clarifiers

- Alternative 1: This alternative would keep the newer clarifier, demolish the two older clarifiers 1 and 2 and build two new 72-foot diameter secondary clarifiers. A flow splitting box to distribute the flow between the two clarifiers would be added. All influent, effluent and sludge piping for the new clarifiers would be included.
- Alternative 2: This alternative would remove all three existing secondary clarifiers and replace them with three, 60-foot diameter clarifiers. A new splitter box would be used to direct the wastewater from the oxidation ditches to the new clarifiers.

3.4.3 Activated Sludge System

- Alternative 1: This alternative includes increasing the size of the existing selector tank, adding drain piping, adding a splitter box to improve flow distribution between the ditches, and adding a third oxidation ditch to expand capacity.
- Alternative 2: This alternative includes increasing the size of the existing selector tank, adding drain piping, adding a splitter box to improve flow distribution between the ditches, and replacing the rotors on the oxidation ditch, or adding supplemental rotors for additional oxygen transfer.

3.4.4 Disinfection

- Alternative 1: This alternative includes increasing the size of the existing chlorine contact tank., modifying inlet piping, and replacing chlorine gas dosing and metering equipment with sodium hypochlorite storage tanks and feed equipment. This alternative would allow the chlorination system to be in in line with Ten States Standards, which requires a contact time of 15 minutes at peak hourly flow. This is roughly 3 times the existing volume. There is available land to the north of the existing tank which could be used for the tank expansion.
- Alternative 2: This alternative includes replacing chlorination with ultraviolet (UV) disinfection, in a new building and removing all chlorination chemicals and equipment.

3.4.5 Solids Handling

- Alternative 1: This alternative includes adding a solids dewatering process in a new building. The advantage of adding a solids dewatering process to the WWTP is that less sludge storage would be required. In addition, the dewatered solids could be hauled to a landfill for disposal, should land application no longer be feasible in the future, offering operational flexibility. The anaerobic digester could also potentially be taken off-line. Anaerobic digestion is not typically used after oxidation ditches, as the ditch is an extended aeration process and there are fewer nutrients available for digestion.
- Alternative 1A: This alternative includes a new solids dewatering process in the existing chlorine contact tank. The advantages identified under Alternative 1 would apply to this alternative, as well. In addition, existing infrastructure, in the form of the chlorine contact tank, would be repurposed.
- Alternative 2: This alternative includes adding an additional solids storage capacity at the WWTP to allow for the longer holding times required due to less frequent land application.

3.4.6 Grit Removal

- Alternative 1: This alternative includes maintaining the existing vortex grit unit and adding a second adjacent unit.
- Alternative 2: This alternative includes demolishing and removing the existing vortex grit system and replacing with a larger vortex grit removal system.

3.5 MONETARY EVALUATION

Capital costs were evaluated and are presented below for each alternative. Opinions of probable costs were prepared for alternatives and are provided in Appendix B of this report.

Present worth analyses for these projects were completed using a discount rate of two percent and are summarized in Table 3-1 to Table 3-6. The present worth analysis includes salvage values. In addition, operation and maintenance (O&M) costs were included for disinfection and solids handling. O&M costs would not vary significantly for the other alternatives and were excluded from the remaining analyses. The user cost is summarized under Section 4. Selected Alternative.

Table 3-1 Present Worth Analysis for the Collection System and Union Street Pump Station

Category	Alternative 1 Reroute Collection System	Alternative 2 Reroute Collection System and Add New Pump Station
Capital Cost	$17,400,000	$21,600,000
Salvage Value	$2,700,000	$3,600,000
Present Worth of Salvage Value	$1,800,000	$2,400,000
Total Present Worth	**$15,600,000**	**$19,200,000**

Table 3-2 Present Worth Analysis for the Secondary Clarifiers

Category	Alternative 1 Two New 72-ft Units	Alternative 2 Three New 60-ft Units
Capital Cost	$10,100,000	$14,000,000
Salvage Value	$1,100,000	$2,000,000
Present Worth of Salvage Value	$800,000	$1,300,000
Total Present Worth	**$9,300,000**	**$12,700,000**

Table 3-3 Present Worth Analysis for the Activated Sludge

Category	Alternative 1 New Oxidation Ditch	Alternative 2 Additional Rotors on Existing Oxidation Ditches
Capital Cost	$11,900,000	$5,500,000
Salvage Value	$1,900,000	$660,000
Present Worth of Salvage Value	$1,300,000	$450,000
Total Present Worth	**$10,600,000**	**$5,050,000**

Table 3-4 Present Worth Analysis for Disinfection

Category	Alternative 1 Sodium Hypochlorite	Alternative 2 UV
Capital Cost	$2,200,000	$5,600,000
Salvage Value	$290,000	$700,000
O&M Cost	$26,000	$60,000
Present Worth of O&M	$430,000	$950,000
Present Worth of Salvage Value	$193,000	$454,000
Total Present Worth	**$2,500,000**	**$6,100,000**

Table 3-5 Present Worth Analysis for Solids Handling

Category	Alternative 1 Sludge Dewatering in New Building	Alternative 1A Sludge Dewatering in Chlorine Contact Tank	Alternative 2 Additional Sludge Storage
Capital Cost	$8,000,000	$3,600,000	$11,500,000
Salvage Value	$950,000	$48,000	$3,006,000
O&M Cost	$87,000	$87,000	$ -
Present Worth of O&M	$1,400,000	$1,400,000	$ -
Present Worth of Salvage Value	$650,000	$33,000	$2,100,000
Total Present Worth	**$8,750,000**	**$4,965,000**	**$9,400,000**

Table 3-6 Present Worth Analysis for Grit Removal

Category	Alternative 1 One, New, Larger Unit	Alternative 2 Add New Unit of Similar Size
Capital Cost	$2,500,000	$1,900,000
Salvage Value	$34,000	$80,000
Present Worth of Salvage Value	$23,000	$55,000
Total Present Worth	**$2,475,000**	**$1,845,000**

Although sodium hypochlorite is less expensive compared directly to UV disinfection, the possibility of placing the sludge dewatering equipment in the chlorine contact tank, makes UV disinfection more attractive. The total present worth for the sodium hypochlorite and sludge dewatering in a new building is compared to UV disinfection with sludge dewatering in the chlorine contact tank is shown in Table 3-7.

Table 3-7 Present Worth Disinfection with Sludge Dewatering

Category	Alternative 1 Sodium Hypochlorite with Sludge Dewatering	Alternative 2 UV with Sludge Dewatering in Chlorine Contact Tank
Capital Cost	$10,200,000	$9,200,000
Salvage Value	$1,240,000	$748,000
O&M Cost	$113,000	$147,000
Present Worth of O&M	$1,830,000	$2,350,000
Present Worth of Salvage Value	$843,000	$487,000
Total Present Worth	**$11,250,000**	**$11,067,000**

3.6 ENVIRONMENTAL EVALUATION

3.6.1 Construction Impacts

The sewer construction will involve open-cut installation, as well as trenchless jack and bore installation for the sewer under the Pine River. There will also be major road reconstruction in River Court. The construction impacts include dust, noise, and traffic disruption. City, County, and State regulations associated with these impacts will be addressed during design as well as in the construction contracts associated with the work.

There are wetlands in St. Louis and a permit from the Michigan Department of Environment, Great Lakes, and Energy (EGLE) may be necessary. The wetlands in the project area are immediately adjacent to the Pine River at the new river crossing. Figure 3-3 and Figure 3-4 display the wetlands in the vicinity of the project area for Alternative 1 and Alternative 2, respectively. The jack and bore method should reduce any impact on the wetlands. The only wetlands on the WWTP site are in the vicinity of an existing storage lagoon that is typically not in service. No changes to the lagoon are proposed under this plan.

The 100-year flood plain in the collection system project area is extensive. The proposed projects would remove three river crossings from service and replace them with one river crossing. Collection System Alternative 2 would require the addition of a second pump station within the 100-year floodplain. A permit will be required for the work performed in the 100-year floodplain in St. Louis and special measures will be taken to comply with all permits. The 100-year floodplain surrounding the project area can be seen in Figure 3-5 and Figure 3-6.

Note that some sanitary sewer main replacements will be located near historical markers or districts known to exist in the City of St. Louis. Figure 3-7 and Figure 3-8 show the historical site locations near Alternative 1 and Alternative 2, respectively. However, there is no proposed work within the district. Upon receipt of funding, further investigation will be needed and a SHPO Part 101 application will be completed, if necessary.

Figure 3-3: Alternative 1 Wetlands in St. Louis

Figure 3-4: Alternative 2 Wetlands in St. Louis

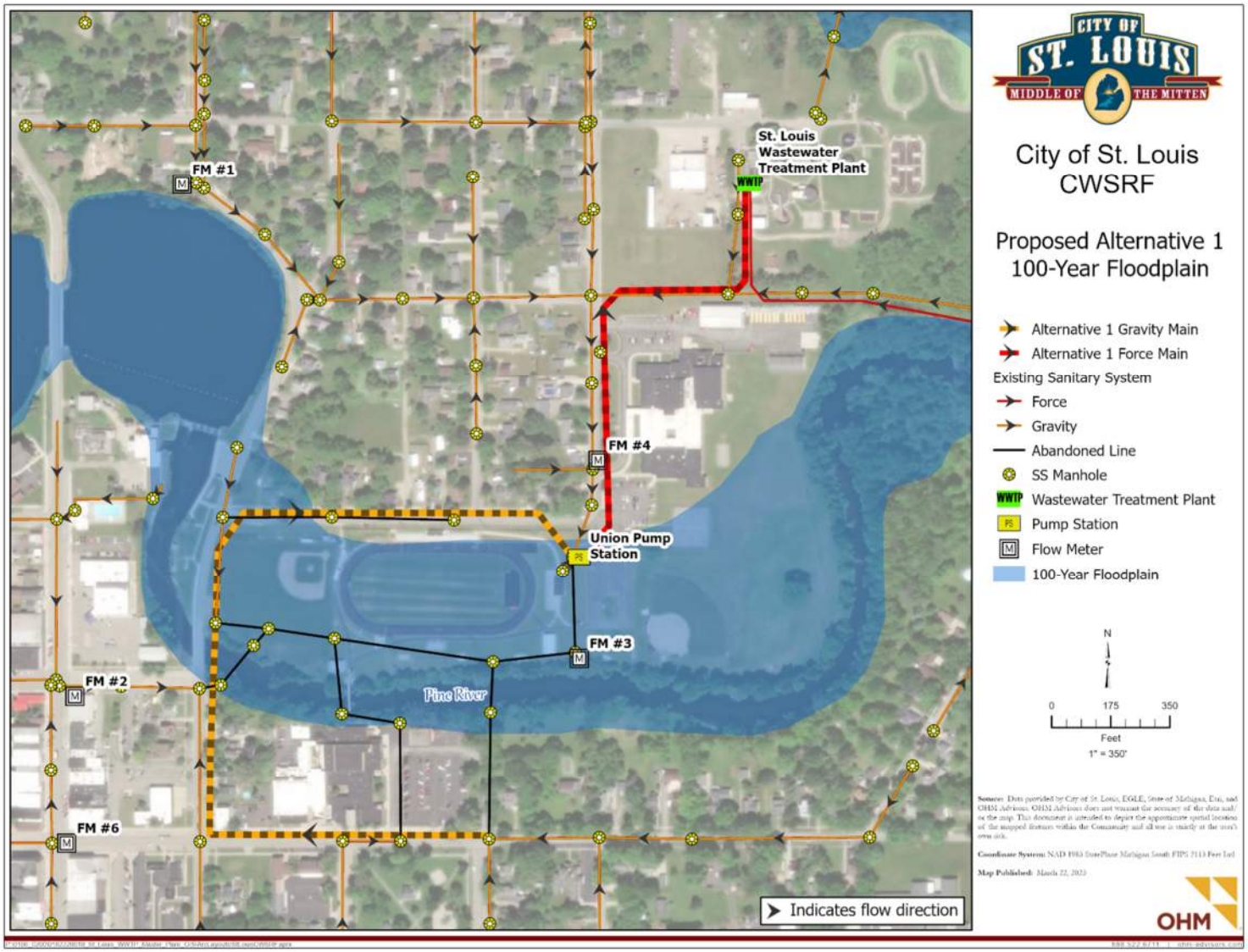


Figure 3-5: Alternative 1 100-Year Floodplain in St. Louis

Figure 3-6: Alternative 2 100-Year Floodplain in St. Louis

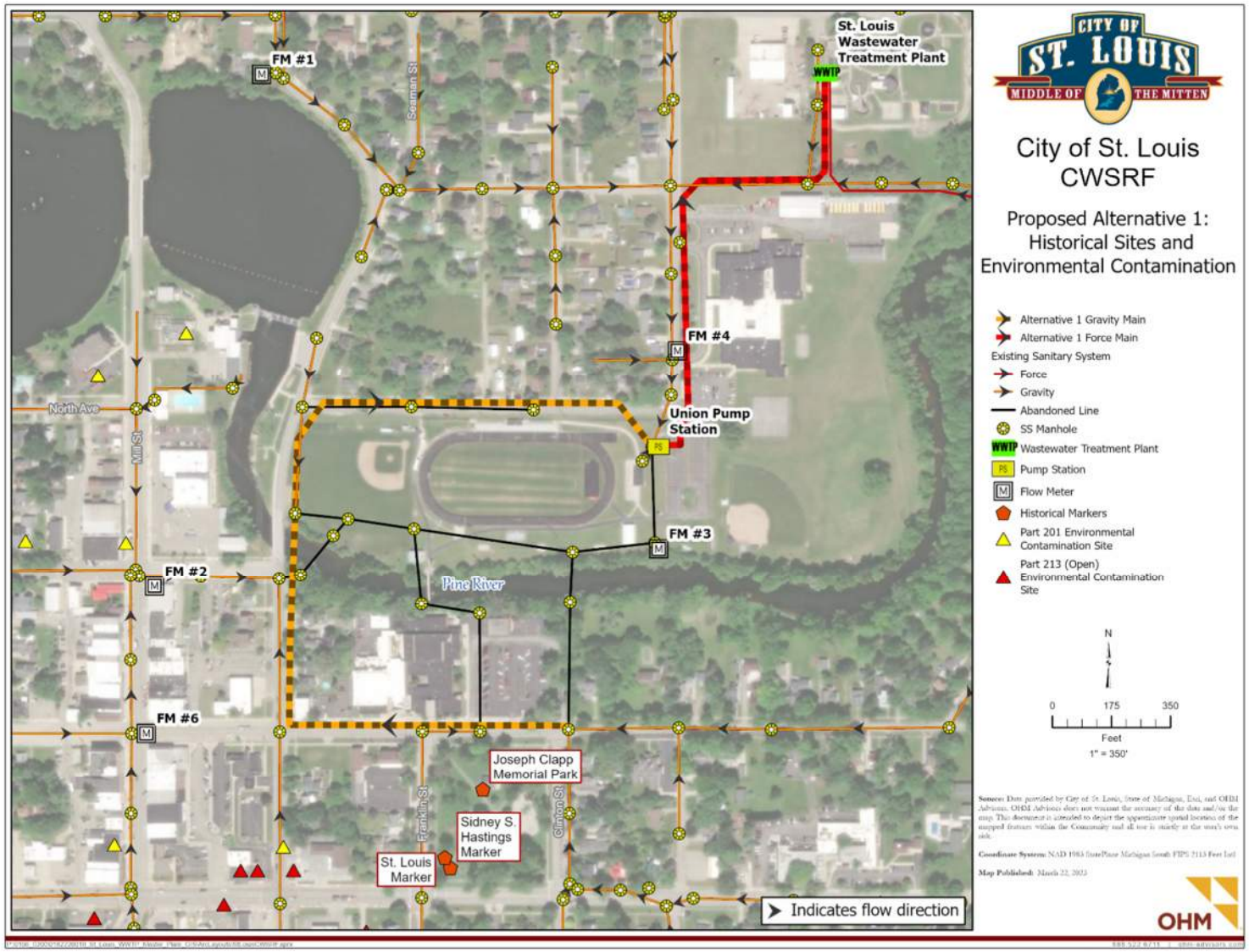


Figure 3-7: Alternative 1 Historical Sites and Environmental Contamination in St. Louis

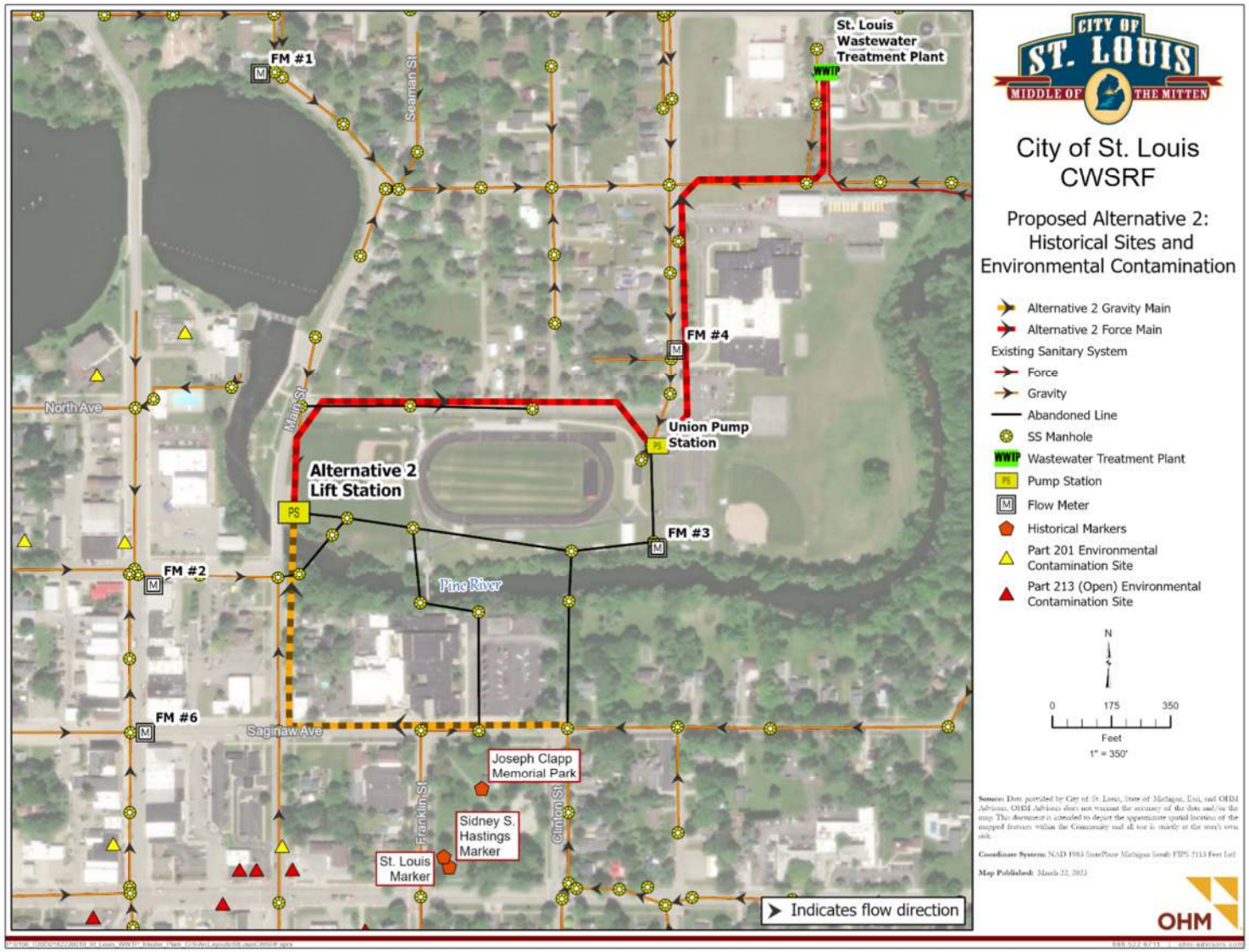


Figure 3-8: Alternative 2 Historical Sites and Environmental Contamination in St. Louis

3.6.2 Endangered Flora/Fauna

The review of the MNFI database identified one State threatened, endangered, or species of special concern has been documented within 1.5 miles of the project area. The Black Redhorse which is classified as a species of concern was observed in 1921 and is found in swiftly flowing rivers. No work is planned to be performed within the Pine River.

During the evaluation for federally protected species through the United States Fish and Wildlife Service (USFWS), information was provided for six species. The species and potential impact are listed in Table 3-8 USFWS . The MNFI and USFWS reviews can be found in Appendix A.

Table 3-8 USFWS Threatened and Endangered Species Potential Impacts

Species	Potential Impact
Eastern Massasauga Rattlesnake	Not likely to adversely affect
Eastern Prairie Fringed Orchid	No effect
Indiana Bat	Not likely to adversely affect
Monarch Butterfly	No effect
Northern Long-Eared Bat	Not likely to adversely affect
Tricolored Bat	No effect

When the limits of ground-disturbing activities are further refined during the design phases for the project, additional review will be made to determine if the habitat for the species will be impacted. If there are any concerns, appropriate actions will be taken to avoid these areas and/or mitigate any disturbance so that the species are protected.

3.6.3 Presence of Contamination

According to EGLE's Inventory of Facilities accessible through the Remediation Information Data Exchange, there are 22 Part 201 and Part 213 sites within the City of St. Louis. Fourteen of the sites are Part 201 Environmental Contamination sites and eight are Part 213 sites, which are leaking underground storage tanks. A summary of the addresses is provided in Table 3-9. These locations are also shown in Figure 3-9.

Table 3-9 Part 201 and Part 213 Sites Located in St. Louis

	Facility Name	Address	Part 201 or Part 213
1	106 N. Main St. & 101 E. Washington	106 N. Main St. & 101 E. Washington	201
2	101 Woodside Drive	101 Woodside Drive	201
3	1512 Virginia Street & Jackson Road Parcel	1512 Virginia Street & Jackson Road Parcel	201
4	219 South Mill Street	219 South Mill Street	201
5	State Owned Parcel-Gratiot	300 N Mill St	201
6	220 South Main Street	220 South Main Street	201
7	220 West Washington Avenue	22 West Washington Avenue	201
8	400 Woodside Drive	400 Woodside Drive	201
9	North Street & North Mill Street - North	Northwest Corner of North Street & North Mill Street	201
10	City of St. Louis, Electric Dept	412 North Mill Street	201
11	Velsicol Chemical Corp	500 Bankston Street	201
12	VN & J SALES	702 W. Jackson Rd	201
13	Velsicol Burn Pit	1270 W Monroe Road	201
14	320 North Mill, St. Louis	320 North Mill Street	201
15	City Of St Louis	118 W Washington St	213
16	Transport Investment Corp	1000 Michigan Ave	213
17	St Louis Citgo LLC	705 E Washington St	213
18	Pine River Auto	101 E Washington St	213
19	7-eleven Store #73	102 W Washington St	213
20	Blodgett Oil Co #42	102 E Washington St	213
21	Cecil Gunderman	102 Michigan Ave	213
22	Mutual Savings	135 W Washington St	213

In the project area for Collection System Alternative 1 and Alternative 2, there are no active sites in the vicinity of the project areas. All the open Part 213 and Part 201 environmental contamination sites in St. Louis are located outside of the project areas for all alternatives.

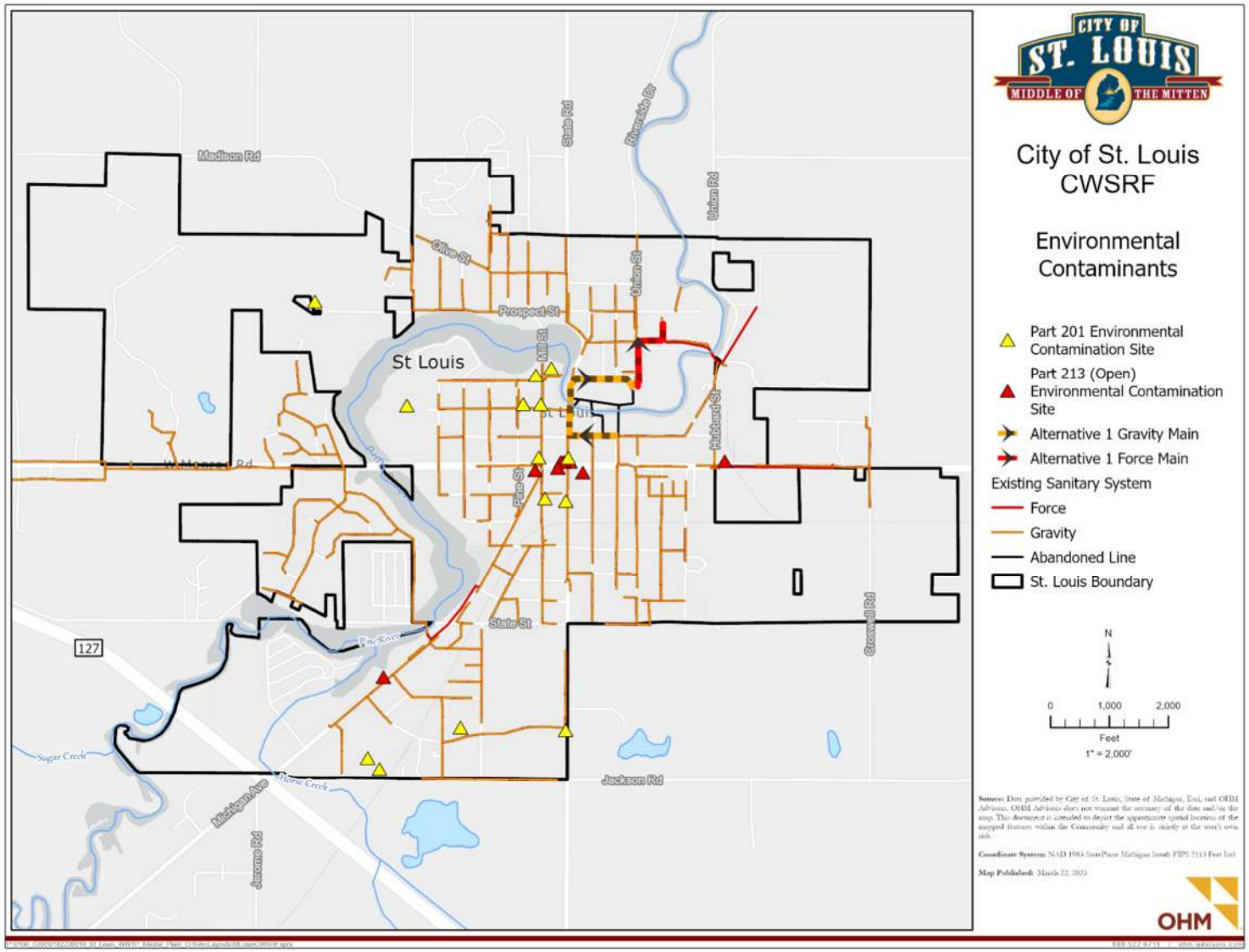


Figure 3-9: Contamination Sites in St. Louis

4. SELECTED ALTERNATIVE

After careful consideration of environmental impacts, monetary impacts, and social impacts, Table 4-1 lists the alternatives that were selected for the collection system and the WWTP assets.

Table 4-1 Selected Alternatives for Sanitary Sewer System Assets

Asset	Selected Alternative
Collection System & Union Street Pump Station	Alternative 1: Reroute Collection System
Secondary Clarifiers	Alternative 1: Two New 72-ft Units
Activated Sludge System	Alternative 2: Additional Rotors on Existing Oxidation Ditches
Disinfection	Alternative 2: UV
Solids Handling	Alternative 1A: Sludge Dewatering in Chlorine Contact Tank
Grit Removal	Alternative 2: Add New Unit of Similar Size

4.1 DESIGN PARAMETERS

4.1.1 Collection System

Alternative 1 includes a proposed sewer route that flows along Saginaw Avenue from Clinton Street to Main Street, then north along Main Street to Saginaw Street to Center Street, then flows north through the river crossing, then along the West side of the St. Louis High School athletic field via gravity sewer where is connects to River Court where it flows East in River Court from Main Street to Union Street Pump Station. The proposed sewer would include 1,120 feet of 15-inch diameter gravity sewer main and 1,800 feet of 24-inch diameter gravity main. Fourteen manholes are proposed to be replaced in the project area. 1,400 feet of new 18-inch diameter ductile iron force main from the Union Street Pump Station to the WWTP is proposed. Approximately, 3,600 feet of sewer will be abandoned where no longer needed. It is desirable for the sewer system to be readily accessible by City maintenance vehicles. Access paths may need to be installed to sewer proposed on the west edge of the athletic field. The existing pumps in the Union Street Pump Station would be removed and replaced with five, 1,200 gpm units. The building would need to be expanded in order to accommodate the pumps. The proposed pumps would provide a firm capacity of 7.0 MGD and allow both average daily flows and peak hourly flows to be accommodated. The sewer will be able to transport a peak hourly flow of 7 MGD to the WWTP.

4.1.2 Secondary Clarifiers

Alternative 1 was chosen for the secondary clarifiers. This alternative includes providing a new splitter box to correctly split the flow between the existing clarifier and two, new 72-ft diameter clarifiers. The older secondary clarifiers would be demolished. The three clarifiers together would treat a peak hourly flow of 7 MGD with one of the 72-ft clarifiers out of service.

4.1.3 Activated Sludge

Alternative 2 was chosen for activated sludge. This includes modifying the existing assets by increasing the size of the existing selector tank to provide the recommended two-hour detention time at a maximum day flow and average RAS flow. A one-hour detention time would be anticipated to be supplied under peak hour conditions. Drain piping would be added as well as baffles to prevent short-circuiting. A new splitter box would be added to improve flow disruption between the ditches. Rotors on the oxidation ditch would be replaced or supplemental rotors would be added for additional oxygen transfer.

4.1.4 Disinfection

Alternative 2 was chosen for disinfection. This includes replacing chlorine gas disinfection with ultraviolet (UV) disinfection. The system will be designed for a peak hourly flow rate of 7 MGD.

4.1.5 Solids Handling

Alternative 1A was chosen for solids handling. This includes installation of a dewatering system in the existing chlorine contact tank in the basement of the Process Building. The anaerobic digester could also be taken off-line, as it would no longer be needed for biosolids stabilization.

4.1.6 Grit Removal

Alternative 2 was chosen for grit removal. The existing vortex grit would be maintained, and a second adjacent unit of equal capacity would be added. The grit system will be able to treat a peak hourly flow of 7 MGD and provide a second unit, in accordance with Ten State Standard requirements.

4.2 USEFUL LIFE

The weighted useful life for the selected projects was calculated as 32.6 years. The useful life for each asset included in the cost opinion was determined based on the values provided in the CWSRF Project Planning Document Preparation Guidance and Professional Engineer's opinion. Table 4-2 summarizes the costs by project area.

Table 4-2 Summary of Costs by Project Area

Asset	Useful Life (years)
Conveyance (Sewers, manholes, inlets, outfalls, weirs)	50
Pump Station Modifications	30
New Pump Station	30
Electrical, Mechanical, Site Lighting	20
Roadwork (curb & gutter)	30
Process Equipment	20
Concrete	50

4.3 SCHEDULE FOR DESIGN AND CONSTRUCTION

The City of St. Louis is requesting consideration for fourth quarter funding under EGLE's CWSRF program. The proposed design and construction schedule is summarized in Table 4-3.

Table 4-3. Design and Construction Schedule

Task	Submittal Date
Draft Documents Submittal to EGLE	2/16/2024
Environmental Assessments Published No Later Than	4/24/2024
Part I and Part II Application	5/15/2024
Final Documents Submittal to EGLE	5/1/2024
Finding of No Significant Impacts Clearance; Plans & Specs Approved	5/24/2024
Bid Ad Published No Later Than	5/24/2024
Part III of Application; Bid Data Submittal (With Tentative Contract Award)	7/08/2024
EGLE Order of Approval Issued	8/07/2024
Borrower's Pre-Closing with the MFA	8/21/2024
MFA Closing	8/28/2024
Notice to Proceed Issued	10/27/2024
Construction Completed for Collection System and Union Street Pump Station, Secondary Clarifiers, Activated Sludge, and Disinfection	12/31/2026
Overall Construction Completed for Solids Handling and Grit Removal	11/15/2027

4.4 WATER AND ENERGY EFFICIENCY

Water and energy conservation efforts will be considered wherever possible in the proposed project, but the improvements are focused on achieving compliance with Ten State Standards and system reliability. Processes that consume energy, such as the replacement of pumps at the Union Street Pump Station, additional vortex grit unit, ultraviolet disinfection units, and sludge dewatering unit will be reviewed to for energy efficiency as part of the selection process.

4.5 COST SUMMARY

A summary of the capital cost of each asset is presented in Table 4-4.

Table 4-4 Summary of Costs by Asset

Category	Capital Cost ($)
Collection System (Alternative 1-) & Union Street PS	$17,400,000
Secondary Clarifiers	$10,100,000
Activated Sludge	$5,500,000
Disinfection	$5,600,000
Grit Removal	$1,900,000
Solids Handling	$3,600,000
Total	$44,100,000

User costs have been evaluated and an analysis is provided in
Table 4-5. An annual interest rate of 2.75% was used to calculate the annual payment.

Table 4-5 User Cost Analysis

Asset	Capital Cost	Annual Payment	Annual Cost per Est. REU*	Monthly Cost per Est. REU*
Collection System (Alternative 1-) & Union Street PS	$17,400,000	$1,143,000	$403	$34
Secondary Clarifiers	$10,100,000	$663,000	$234	$19
Activated Sludge	$5,500,000	$361,000	$127	$11
Disinfection	$5,600,000	$368,000	$130	$11
Grit Removal	$1,900,000	$125,000	$44	$4
Solids Handling	$3,600,000	$236,000	$83	$7
Total	$44,100,000	$2,896,000	$1,020	$85

*Average household size of 2.47 in the City of St Louis Area per 2020 Census.

4.6 IMPLEMENTABILITY

The selected alternative will be implemented by the City of St. Louis. All work is under the jurisdiction of the City and requires no inter-municipal agreements. St. Louis has the legal, institutional, technical, financial, and managerial capacity to implement the project. All work will be performed in road rights-of-way, utility easements, or on property owned by the City of St. Louis.

5. ENVIRONMENTAL AND HEALTH IMPACTS

Adoption of this alternative would improve the reliability of the distribution system by rerouting the sanitary sewer from aging pipes to new sanitary sewer mains.

5.1 DIRECT IMPACTS

5.1.1 Construction Impacts

The construction impacts will be short-term impacts that will be mitigated or reversed through adequate restoration of the local roadway and City owned properties. The sewer reconstruction in Saginaw Street, Main Street, and River Court will be open-cut installation. Major road reconstruction will occur in River Court due to construction of deep sewers. The sewer reconstruction under Pine River will be trenchless jack and bore installation. During this installation, a cofferdam construction method may need to be used to install pit. Coordination with Gratiot County will be required to obtain all necessary permits. All work will be completed by the proper permits. Work along the Pine River and at the Union Street Pump Station will be in the 100-year floodplain.

Normal construction activities have the potential to produce noise and dust. Work hours and construction noise will be required to meet local Ordinance requirements. All work will be required to comply with the State's Soil Erosion and Sedimentation Control requirements.

5.1.2 Operational Impacts

The replacement of sanitary sewers will have some impact on traffic in the vicinity of where the construction is occurring. It will be necessary to coordinate with the City's road maintenance department to ensure the City's traffic control standards are met. The project may require lane closures along most adjacent segments of road. The construction area impacts several signalized intersections, as well as many unsignalized intersections, and driveways. There is a high school and middle school within the project area which will require coordination so that impacts to traffic and busses are minimized. The high school's athletic field and its parking lot will be impacted temporarily by construction and coordination will be necessary for this area as well. Construction at the Union Street Pump Station and the WWTP will not impact the public. Staging coordination will be required to maintain existing assets in operation until new assets can be brought into service.

5.1.3 Social Impacts

Impacts on materials, land, and energy will be minimized by selection of qualified contractors. Once the projects located in the roadway are completed, the pavement that was disturbed will be restored.

5.2 INDIRECT IMPACTS

There are no anticipated impacts to the rate, density, or type of development due to this project. There is not projected to be any growth in the area over the next 20 years. There are no expected changes in land use. There are no expected changes in air quality due to primary or secondary development. Impacts related to air quality are limited to direct impacts due to traffic and construction equipment.

There are no anticipated changes to the natural setting or ecosystem. The MNFI and USFWS reviews indicated that special concern, threatened, and endangered species are not likely to be impacted by the proposed projects. Tree clearing will be avoided to the extent possible. If tree clearing is necessary, it will occur between October 1st and May 31st to avoid impacting bat species.

Impacts on cultural, human, social, and economic sources are expected to be minimal, and occur during the

construction phase as a result of the traffic routing around the construction area. These impacts are expected to be short-term. The historical markers and the historic district in St. Louis are not expected to be affected by the proposed work.

There is no anticipated resource consumption over the useful life of the sanitary sewer main and it is not expected to generate wastes. The solids dewatering equipment will decrease the volume of biosolids generated at the WWTP. Aesthetic impacts are anticipated to be short-term and occur during the construction phase. Following construction, project areas will be restored to their previous conditions.

5.3 CUMULATIVE IMPACTS

The selected alternative will have a positive impact overall on the neighborhood and the Pine River. The project will reduce the potential for sanitary sewer overflows (SSOs) that discharge into the Pine River. The reduction of untreated sanitary sewage into the Pine River will have positive environmental impacts.

6. MITIGATION

6.1 MITIGATION OF SHORT-TERM IMPACTS

Typical construction mitigation is expected for the selected alternatives. Traffic control may be required during the construction of the sanitary sewer mains. Access to some roads may be temporarily restricted to provide a safe working environment. Soil erosion and sedimentation control measures will be required during the sanitary sewer replacements to ensure nearby water mains are not impacted by the construction process. Vegetation disrupted by the construction process and areas within the 100-year floodplain will be rehabilitated to its original condition. Service will be maintained for residents during construction, with short term disruptions due to sanitary sewer replacements.

Limited tree clearing may be required. Trees to be removed would be identified during the design phase. An evaluation for the need to perform site visits to survey for wetlands will be performed during design. Short term impacts related to the WWTP projects are not anticipated.

Construction activities start as early as year 2024. All construction activities are anticipated to conclude in 2026 and 2027.

6.2 MITIGATION OF LONG-TERM IMPACTS

No long-term impacts are anticipated as part of the sanitary sewer project. Sensitive species are not anticipated to be impacted.

6.3 MITIGATION OF INDIRECT IMPACTS

The proposed project is intended to improve the reliability of the existing system by rerouting the sanitary sewer from aging pipes to new sanitary sewer mains. The project is not intended to induce growth within the project area.

7. PUBLIC PARTICIPATION

7.1 PUBLIC MEETING

A public meeting was held on April 18, 2023 and the proposed projects were reviewed.

7.2 PUBLIC MEETING ADVERTISEMENT

The public meeting notice was published on March 31, 2023. The public meeting notice was placed on the City's website along with a copy of the draft Project Plan for public review. A copy of the advertisement for the public meeting can be found in Appendix C.

7.3 PUBLIC MEETING SUMMARY

A sample of public meeting documents can be found in Appendix C.

7.4 ADOPTION OF THE PROJECT PLAN DOCUMENT

The City Council adopted a resolution following the public meeting on April 18, 2023. A sample copy of the resolution is included in Appendix D, along with the CWSRF Submittal Form.

8. TECHNICAL CONSIDERATIONS

Transporting current peak hourly flows to the WWTP through collection system and pump station improvements will increase the reliability of service to residents and customers.

Applicable EGLE procedures, Ten States Standards, as well as local ordinances shall be strictly adhered to during design and construction.

8.1 INFILTRATION AND INFLOW

A copy of the 2021 report entitled Sanitary Sewer Improvements and was previously provided to the EGLE District Engineer, which contained a review of infiltration and inflow, as well as methods considered for reduction.

8.2 FISCAL SUSTAINABILITY PLAN

A Fiscal Sustainability Plan is not applicable. The proposed alternatives are addressing concerns related to meeting Ten State Standards. The completed form is found in Appendix E and was signed by the City.

APPENDIX A: MNFI AND U.S. FISH AND WILDLIFE SERVICE DATABASE REVIEW

February 28, 2023

Michigan Natural Features Inventory (MNFI) Web Database Review – St. Louis CWSRF, Gratiot County, MI

OHM has reviewed the Threatened and Endangered Species list generated by the MNFI Web Database, conducted on February 28, 2023. During this Review, the project location was checked against known localities for rare species, and **1** State threatened, endangered, or species of special concern has been documented within the 1.5 mile project area buffer and it is possible that without proper management negative impacts may occur. The species listed include the following: Black Redhorse (Moxostoma duquesnei). Additionally, ESA Section 7 species were generated via the U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) website and comments were provided for **8** Federally listed threatened, endangered, or candidate species and included the Indiana Bat (Myotis sodalis), Northern Long-Eared Bat (Myotis septentrionalis), Tricolored Bat (Perimyotis subflavus), Eastern Massasauga Rattlesnake (Sistrurus c. catenatus), Monarch Butterfly (Danaus plexipuss) and Eastern Prairie Fringed Orchid (Platanthera leucophaea). Determinations for Federally listed species will be made utilizing the U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) website.

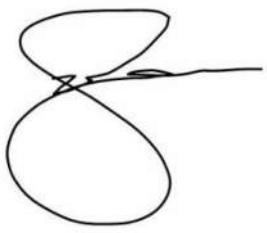
The St. Louis CWSRF project involves abandonment of existing sewer line that will be filled with flowable fill and bulkhead. New sewer line will be installed utilizing jack and bore methods and directional drilling under the Pine River.

For the **1** State listed species in the document provided OHM Advisors has made preliminary determinations related to potential field surveys for listed species. In response to the Rare Species Review provided by MNFI OHM Advisors has prepared the following strategy and documentation to ensure this project does not result in take of species listed in the review.

Black Redhorse (Moxostoma duquesnei) State Species of Special Concern. MNFI describes the habitat for this species as swift flowing areas in medium- to large-sized rivers with clear water and sand, gravel, and rock substrates. Black redhorse is less tolerant of turbid water, low gradient rivers, and siltation. No in water work will occur during the project. The last observation of this species in within 1.5 miles of the project area occurred in 1921. OHM has determined no effect to this species. In the event Black Redhorse is observed during project activities said observation will be reported to local county MDNR office within 24 hours.

If additional information is needed, please contact me via email at wade.rose@ohm-advisors.com.

Sincerely,



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FISH AND WILDLIFE SERVICE
Michigan Ecological Services Field Office
2651 Coolidge Road Suite 101
East Lansing, MI 48823-6360
Phone: (517) 351-2555 Fax: (517) 351-1443

In Reply Refer To: March 03, 2023
Project code: 2023-0051664
Project Name: St. Louis CWSRF

Subject: Verification letter for the project named 'St. Louis CWSRF' for specified threatened and endangered species that may occur in your proposed project location consistent with the Michigan Endangered Species Determination Key (Michigan DKey)

Dear Wade Rose:

The U.S. Fish and Wildlife Service (Service) received on **March 03, 2023** your effect determination(s) for the 'St. Louis CWSRF' (the Action) using the Michigan DKey within the Information for Planning and Consultation (IPaC) system. The Service developed this system in accordance with the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based on your answers and the assistance of the Service's Michigan DKey, you made the following effect determination(s) for the proposed Action:

Species	**Listing Status**	**Determination**
Eastern Massasauga (=rattlesnake) (*Sistrurus catenatus*)	Threatened	NLAA
Eastern Prairie Fringed Orchid (*Platanthera leucophaea*)	Threatened	No effect
Indiana Bat (*Myotis sodalis*)	Endangered	NLAA
Monarch Butterfly (*Danaus plexippus*)	Candidate	No effect
Northern Long-eared Bat (*Myotis septentrionalis*)	Threatened	NLAA
Tricolored Bat (*Perimyotis subflavus*)	Proposed Endangered	No effect

The Service will notify you within 30 calendar days if we determine that this proposed Action does not meet the criteria for a "may affect, not likely to adversely affect" (NLAA) determination for Federally listed species in Michigan. If we do not notify you within that timeframe, you may proceed with the Action under the terms of the NLAA concurrence provided here. This verification period allows the Michigan Ecological Services Field Office to apply local knowledge to evaluation of the Action, as we may identify a small subset of actions having

impacts that were unanticipated. In such instances, the Michigan Ecological Services Field Office may request additional information to verify the effects determination reached through the Michigan DKey.

Your agency has met consultation requirements by informing the Service of your “No Effect” determination(s). No consultation is required for species that you determined will not be affected by the Action.

Please provide sufficient project details on your project homepage in IPaC (Define Project, Project Description) to support your conclusions and the Service’s 30-day review period. Failure to disclose important aspects of your project that would influence the outcome of your effects determinations may negate your determinations and invalidate this letter. If you have site-specific information that leads you to believe a different determination is more appropriate for your project than what the Dkey concludes, you can and should proceed based on the best available information.

The Service recommends that you contact the Service or re-evaluate the project in IPaC if: 1) the scope or location of the proposed Action is changed; 2) new information reveals that the action may affect listed species or designated critical habitat in a manner or to an extent not previously considered; 3) the Action is modified in a manner that causes effects to listed species or designated critical habitat; or 4) a new species is listed or critical habitat designated. If any of the above conditions occurs, additional consultation with the Service should take place before project changes are final or resources committed.

For non-Federal representatives: Please note that when a project requires consultation under section 7 of the Act, the Service must consult directly with the Federal action agency unless that agency formally designates a non-Federal representative (50 CFR 402.08). Non-Federal representatives may prepare analyses or conduct informal consultations; however, the ultimate responsibility for section 7 compliance under the Act remains with the Federal agency. If the Federal agency concurs with your determination, the project as proposed has completed section 7 consultation. All documents and supporting correspondence should be provided to the Federal agency for their records.

Bats of Conservation Concern:
Implementing protective measures for bats, including both federally listed and non-listed species, indirectly helps to protect Michigan’s agriculture and forests. Bats are significant predators of nocturnal insects, including many crop and forest pests. For example, Whitaker (1995) estimated that a single colony of 150 big brown bats (Eptesicus fuscus) would eat nearly 1.3 million pest insects each year. Boyles et al. (2011) noted the “loss of bats in North America could lead to agricultural losses estimated at more than $3.7 billion/year, and Maine and Boyles (2015) estimated that the suppression of herbivory by insectivorous bats is worth >1 billion USD globally on corn alone. In captive trials, northern long-eared bats were found to significantly reduce the egg-laying activity of mosquitoes, suggesting bats may also play an important role in controlling insect-borne disease (Reiskind and Wund 2009). Mosquitoes have also been found to be a consistent component of the diet of Indiana bats and are eaten most heavily during pregnancy (6.6%; Kurta and Whitaker 1998). Taking proactive steps to help protect bats may be very valuable to agricultural and forest product yields and pest management costs in and around

a project area. Such conservation measures include limiting tree clearing during the bat active season (April through Octobervaries by location) and/or the non-volant period (June through July), when young bats are unable to fly, and minimizing the extent of impacts to forests, wetlands, and riparian habitats.

Bald and Golden Eagles:
Bald eagles, golden eagles, and their nests are protected under the Bald and Golden Eagle Protection Act (54 Stat. 250, as amended, 16 U.S.C. 668a-d) (Eagle Act). The Eagle Act prohibits, except when authorized by an Eagle Act permit, the "taking" of bald and golden eagles and defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." The Eagle Act's implementing regulations define disturb as "…to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

If the Action may impact bald or golden eagles, additional coordination with the Service under the Eagle Act may be required. For more information on eagles and conducting activities in the vicinity of an eagle nest, please visit https://www.fws.gov/library/collections/all-about-eagles. In addition, the Service developed the National Bald Eagle Management Guidelines (May 2007) in order to assist landowners in avoiding the disturbance of bald eagles. The full Guidelines are available at https://www.fws.gov/media/national-bald-eagle-management-guidelines-0.

If you have further questions regarding potential impacts to eagles, please contact Chris Mensing, Chris_Mensing@fws.gov or 517-351-2555.

Monarch butterfly and other pollinators
In December 2020, after an extensive status assessment of the monarch butterfly, we determined that listing the monarch under the Endangered Species Act is warranted but precluded by higher priority actions to amend the Lists of Endangered and Threatened Wildlife and Plants. Therefore, the Service added the monarch butterfly to the candidate list. The Service will review its status each year until we are able to begin developing a proposal to list the monarch.

The Endangered Species Act does not establish protections or consultation requirements for candidate species. Some Federal and State agencies may have policy requirements to consider candidate species in planning. We encourage implementing measures that will remove or reduce threats to these species and possibly make listing unnecessary.

For all projects, we recommend the following best management practices (BMPs) to benefit monarch and other pollinators.

Monarch and Pollinator BMP Recommendations

Consider monarch and other pollinators in your project planning when possible. Many pollinators are declining, including species that pollinate key agricultural crops and help maintain natural plant communities. Planting a diverse group of native plant species will help support the nutritional needs of Michigan's pollinators. We recommend a mix of flowering trees, shrubs, and herbaceous plants so that something is always blooming and pollen is available during the active

periods of the pollinators, roughly early spring through fall (mid-March to mid-October). To benefit a wide variety of pollinators, choose a wide range of flowers with diverse colors, heights, structure, and flower shape. It is important to provide host plants for any known butterfly species at your site, including native milkweed for Monarch butterfly. Incorporating a water source (e.g., ephemeral pool or low area) and basking areas (rocks or bare ground) will provide additional resources for pollinators.

Many pollinators need a safe place to build their nests and overwinter. During spring and summer, leave some areas unmowed or minimize the impacts from mowing (e.g., decrease frequency, increase vegetation height). In fall, leave areas unraked and leave plant stems standing. Leave patches of bare soil for ground nesting pollinators.

Avoid or limit pesticide use. Pesticides can kill more than the target pest. Some pesticide residues can kill pollinators for several days after the pesticide is applied. Pesticides can also kill natural predators, which can lead to even worse pest problems.

Planting native wildflowers can also reduce the need to mow and water, improve bank stabilization by reducing erosion, and improve groundwater recharge and water quality.

Resources:

https://www.fws.gov/initiative/monarchs
https://www.fws.gov/library/collections/pollinators

Wetland impacts:
Section 404 of the Clean Water Act of 1977 (CWA) regulates the discharge of dredged or fill material into waters (including wetlands) of the United States. Regulations require that activities permitted under the CWA (including wetland permits issued by the Michigan Department of Environment, Great Lakes, and Energy (EGLE)) not jeopardize the continued existence of species listed as endangered or threatened. Permits issued by the U.S. Army Corps of Engineers must also consider effects to listed species pursuant to section 7 of the Endangered Species Act. The Service provides comments to the agencies that may include permit conditions to help avoid or minimize impacts to wildlife resources including listed species. For this project, we consider the conservation measures you agreed to in the determination key and/or as part of your proposed action to be non-discretionary. If you apply for a wetland permit, these conservation measures should be explicitly incorporated as permit conditions. Include a copy of this letter in your wetland permit application to streamline the threatened and endangered species review process.

Bat References
Boyles, J.G., P.M. Cryan, G.F. McCracken, T.H. Kunz. 2011. Economic Importance of Bats in Agriculture. Science 332(1):41-42.
Kurta, A. and J.O. Whitaker. 1998. Diet of the Endangered Indiana Bat (Myotis sodalis) on the Northern Edge of Its Range. The American Midland Naturalist 140(2):280-286.
Reiskind, M.H. and M.A. Wund. 2009. Experimental assessment of the impacts of northern long-eared bats on ovipositing Culex (Diptera: Culicidae) mosquitoes. Journal of Medical Entomology 46(5):1037-1044.

Whitaker, Jr., J.O. 1995. Food of the big brown bat Eptesicus fuscus from maternity colonies in Indiana and Illinois. American Midland Naturalist 134(2):346-360.

Summary of conservation measures for your project You agreed to the following conservation measures to avoid adverse effects to listed species and our concurrence is only valid if the measures are fully implemented. These must be included as permit conditions if a permit is required and/or included in any contract language.

To increase human safety and awareness of EMR, those implementing the project must first review the EMR factsheet (available at https://www.fws.gov/media/eastern-massasauga-rattlesnake-fact-sheet), and watch MDNR's "60-Second Snakes: The Eastern Massasauga Rattlesnake" video (available at https://youtu.be/~PFnXe_e02w).

During project implementation, report sightings of any federally listed species, including EMR, to the Service within 24 hours.

The project will not result in permanent loss of more than one acre of wetland or conversion of more than 10 acres of EMR upland habitat (uplands associated with high quality wetland habitat) to other land uses.

Indiana bat
Any cutting/trimming of potential roost trees for Indiana bat (trees ≥5 inches in diameter [at breast height] with cracks, crevices and/or exfoliating bark) must occur OUTSIDE the non-volant ("pup") season for Indiana bat (June 1 through July 31). Prescribed fire and/or pesticide/herbicide application must also occur outside June-July where potential roost trees are present.

Tree cutting/trimming and/or prescribed burning will not clear ≥20 contiguous acres of forest or fragment a connective corridor between 2 or more forest patches of at least 5 acres.

Northern long-eared bat
Based on the project area you entered into IPaC, the project does not occur within 0.25 miles of a known northern long-eared bat hibernaculum. Tree removal, as defined in the 4(d) rule, will not occur within 150 feet of a known occupied northern long-eared bat maternity roost tree.

Any cutting/trimming of potential roost trees for northern long-eared bat (trees ≥3 inches in diameter [at breast height] with cracks, crevices, cavities, and/or exfoliating bark) will be limited to the inactive season (October 1 through April 14). Prescribed fire and/or pesticide/herbicide application will also occur during the inactive season where potential roost trees are present.

Tree cutting/trimming and/or prescribed burning will not clear ≥20 contiguous acres of forest or fragment a connective corridor between 2 or more forest patches of at least 5 acres.

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

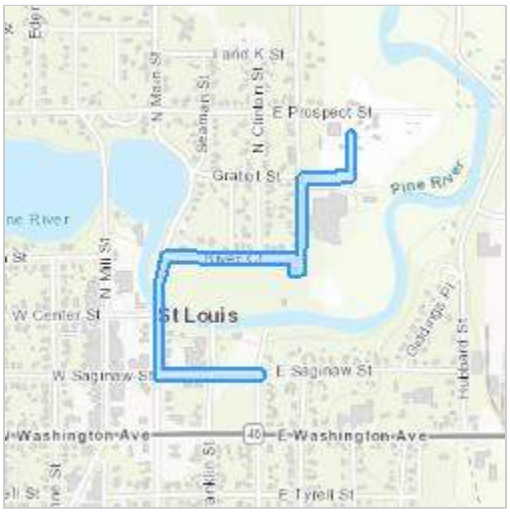
St. Louis CWSRF

2. Description

The following description was provided for the project 'St. Louis CWSRF':

> The project will involve the installation of new gravity main and force main sanitary sewer system that will utilize jack and bore and directional drilling. The existing sewer will be abandoned in place and filled using a flowable filler and bulkheaded.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@43.41179635,-84.6048163639516,14z



APPENDIX B: OPINION OF PROBABLE COSTS

Project Summary
Engineer's Opinion of Probable Project Costs

OHM Advancing Communities
Engineering Advisors

Owner: City of St. Louis
Project: St. Louis Sanitary Sewer Improvements
Work: OPTION C2: Gravity from Main St to Union PS
Reconstruct sewer in Main St.
Reconstruct sewer in Saginaw St.
Reconstruct sewer in River Ct to flow east
Build new FM from Union PS to WWTP
Improvements to Union PS - max flow 4,770 gpm
Major road reconstruction River, Saginaw and Main due to sewer location

Date: 3/10/2023
Project No. 0182-20-0010
Prepared By: LPF
Reviewer: LPF
Current ENR: 13745

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
1	Soil Erosion and Sedimentation Control (1%)	1	LS	$62,000	$62,000
2	Traffic Control and Maintenance (5%)	1	LS	$309,000	$309,000
3	18" Diameter DI Force Main (conveying 4770 gpm) Union PS to WWTP*	1,550	FT	$1,000	$1,550,000
4	Sewer Rem, Less than 24"	3,000	FT	$60	$180,000
5	Non-Strucutral Flowable Fill	61	CYD	$200	$12,138
6	Sanitary Structure, Rem	11	EA	$800	$8,800
7	Slope Restoration	500	SYD	$4	$2,000
8	15" Sanitary Sewer (0-10 ft deep)	360	FT	$275	$99,000
9	15" Sanitary Sewer (11-20 ft deep)	960	FT	$300	$288,000
12	24" Sanitary Sewer (0-10 ft deep)	480	FT	$350	$168,000
13	24" Sanitary Sewer (11-20 ft deep)	500	FT	$400	$200,000
14	24" Sanitary Sewer (20+ ft deep)	700	FT	$450	$315,000
15	24" Sanitary Sewer - Bore and Jack in Casing Pipe	120	FT	$1,000	$120,000
16	Sanitary Manhole, 4' diameter (0 -10 ft deep)	4	Each	$8,000	$32,000
17	Sanitary Manhole, 4' diameter (11 to 20 ft deep)	8	Each	$12,000	$96,000
18	Sanitary Manhole, 4' diameter (over 20 ft deep)	2	Each	$20,000	$40,000
19	Sewer Service Replacement	21	Each	$10,000	$210,000
20	Connection to WWTP	1	LS	$50,000	$50,000
21	Reconnect Existing Sewers	5	Each	$10,000	$50,000
22	Trench Dewatering (40% of sewer length)	1,200	FT	$100	$120,000
23	Union St. Pump Station Modifications - upgrade to 4770 gpm	1	LS	$2,340,000	$2,340,000
24	Electrical supply and equipment for pump station (10%)	1	LS	$234,000	$234,000
25	Bypass Pumping	1	LS	$50,000	$50,000
26	Clearing and Tree Removal	0.5	acre	$4,000	$2,000
27	Surface Restoration (assume 10% of project)	1	LS	$654,000	$654,000
28	River Ct. road reconstruction - 26' wide - asphalt	3,800	SYD	$100	$380,000
29	Saginaw Rd. - 34' wide with concrete curb and gutter	3,600	SYD	$255	$918,000
30	Main St. - 40' wide with concrete curb and gutter	3,400	SYD	$255	$867,000
				TRADES SUBTOTAL	**$9,357,000**
	CONTRACTUAL REQUIREMENTS				
	General Conditions	10%			$936,000
	General Requirements	5%			$468,000
				TOTAL CONSTRUCTION COST	$10,761,000
	Contingencies	30%			$3,229,000
	PROJECT COSTS				
	Engineering, staking, construction eng. and contract admin.	25%			$2,690,250
	Finance and Legal	5%			$539,000
	Allowance for Property Acquisition		LS		$1,000
	Geotechnical Services	1.5%			$162,000
	Assumptions:				
	1. No wetland will need to be mitigated				
	2. No hazardous or contaminated soils will need to be disposed of				
	3. No utilities will need to be relocated				
	ENGINEER'S OPINION OF PROJECT COST				**$17,400,000**
	**includes control valves, air release valves, clean outs and restoration*				

Project Summary
Engineer's Opinion of Probable Project Costs

Owner: City of St. Louis
Project: St. Louis Sanitary Sewer Improvements
Work: OPTION C3: PS in SW corner Athletic Field and FM in River
Reconstruct sewer in Main St.
Reconstruct sewer in Saginaw St.
Build new FM in River Ct (flow to east) conveying 4,770 gpm to Union PS
Pick up River Ct houses with grinder pump installations
Build new Lift Station at SW corner of athletic field (3,655 gpm)
Build new FM from Union PS to WWTP
Improvements to Union PS - max flow 4,770 gpm
Major road reconstruction Saginaw and Main due to sewer location

Date: 3/14/2023
Project No. 0182-20-0010
Prepared By: LPF
Reviewer: LPF
Current ENR: 13745

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
1	Soil Erosion and Sedimentation Control (1%)	1	LS	$86,000	$86,000
2	Traffic Control and Maintenance (3%)	1	LS	$257,000	$257,000
3	Non-Strucutral Flowable Fill	61	CYD	$200	$12,138
4	Sanitary Structure, Rem	11	EA	$800	$8,800
5	Slope Restoration	500	SYD	$4	$2,000
6	16" Diameter DI Force Main (conveying 3645) Main St to Union PS	1,400	FT	$1,000	$1,400,000
7	18" Diameter DI Force Main (conveying 4770 gpm) Union PS to WWTP*	1,550	FT	$1,000	$1,550,000
8	15" Sanitary Sewer (0-10 ft deep)	360	FT	$275	$99,000
9	15" Sanitary Sewer (11-20 ft deep)	960	FT	$300	$288,000
12	15" Sanitary Sewer - Jack and Bore in Casing Pipe	120	FT	$450	$54,000
13	Sanitary Manhole, 4' diameter (0 -10 ft deep)	4	Each	$8,000	$32,000
14	Sanitary Manhole, 4' diameter (11 to 20 ft deep)	4	Each	$12,000	$48,000
15	Sewer Service Replacement	11	Each	$1,500	$16,500
16	Connection to Existing Sewer	1	LS	$30,000	$30,000
17	Reconnect Existing Sewers	5	Each	$2,000	$10,000
18	Grinder pump connections for homes on River	10	Each	$6,000	$60,000
19	Trench Dewatering (10% of sewer length)	290	FT	$50	$14,500
20	Pump Station Site Dewatering	1	LS	$100,000	$100,000
21	Union St. Pump Station Modifications - upgrade 4770 gpm	1	LS	$2,340,000	$2,340,000
22	New PS at SW corner of field- 3655 gpm	1	LS	$2,000,000	$2,000,000
23	Electrical supply and equipment for pump station (10%)	1	LS	$200,000	$200,000
24	Bypass Pumping	1	LS	$50,000	$50,000
25	Standby Generator	1	LS	$150,000	$150,000
26	Site work at PS site	1	LS	$100,000	$100,000
27	Clearing and Tree Removal	1	acre	$4,000	$4,000
28	Surface Restoration (assume 10% of project)	1	LS	$891,000	$891,000
29	Saginaw Rd. - 34' wide with concrete curb and gutter	3,600	SYD	$255	$918,000
30	Main Street - 40' wide with concrete curb and gutter	3,400	SYD	$255	$867,000
				TRADES SUBTOTAL	**$11,588,000**
	CONTRACTUAL REQUIREMENTS				
	General Conditions	10%			$1,159,000
	General Requirements	5%			$579,000
				TOTAL CONSTRUCTION COST	$13,326,000
	Contingencies	30%			$3,998,000
	PROJECT COSTS				
	Engineering, staking, construction eng. and contract admin.	25%			$3,331,500
	Finance and Legal	5%			$667,000
	Allowance for Utility Service and Connections for PS		LS		$25,000.00
	Allowance for Property Acquisition		LS		$1,000
	Geotechnical Services	1.5%			$200,000
	Assumptions:				
	1. No wetland will need to be mitigated				
	2. No hazardous or contaminated soils will need to be disposed of				
	3. No utilities will need to be relocated				
	ENGINEER'S OPINION OF PROJECT COST				**$21,600,000**
	**includes control valves, air release valves, clean outs and restoration*				

Project Summary
Engineer's Opinion of Probable Project Costs

Owner:	**City of St Louis**	**Date:**	**2/23/2023**
Project:	**WWTP Master Plan**	**Project No.**	**0182-22-0010**
Work:	**WWTP Improvements**	**Prepared By:**	**P. Fletcher**
	Union Street - Addition of new pumps and structure	**Reviewer:**	**T. Allbaugh**
	[X] Conceptual [ ] Preliminary [ ] Final	**Installed:**	**1954, 1999**

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
1	**Sitework**				
	Excavation and Hauling	1	CY	$35.00	$10,000.00
	Piping	1	LS	$22,000.00	$22,000.00
	Demolition of existing building wall to connect wet well	1	LS	$30,000.00	$30,000.00
2	**Structural**				
	New Tank - 18 x 14 x 24D				
	Base slab	1	CY	$1,200.00	$37,000.00
	Walls	1	CY	$800.00	$106,000.00
2	**Process**				
	1,200 gpm Pumps	5	EA	$68,000.00	$340,000.00
	VFDs	5	EA	$20,000.00	$100,000.00
	Piping	1	LS	$273,000.00	$273,000.00
	Controls	1	LS	$129,000.00	$129,000.00
	Electrical and Instrumentation 25%	1	LS	$122,500.00	$130,000.00
	Mechanical 15%	1	LS	$73,500.00	$80,000.00
				Sub-total	$1,257,000.00
	CONTRACTUAL REQUIREMENTS				
	General Conditions	10%			$126,000
	General Requirements	5%			$63,000
				TOTAL CONSTRUCTION COST	$1,446,000
	Contingencies	30%			$434,000
	PROJECT COSTS				
	Engineering, construction eng., contract admin.	25%			$361,500
	Finance and Legal	5%			$73,000
	Utility Service and Connections for equipment		LS		$25,000
	ENGINEER'S OPINION OF PROJECT COST				**$2,340,000**

Alternative 1
Project Summary
Engineer's Opinion of Probable Project Costs

Owner:	**City of St Louis**	**Date:**	**2/23/2023**
Project:	**WWTP Master Plan**	**Project No.**	**0182-22-0010**
Work:	**WWTP Improvements**	**Prepared By:**	**P. Fletcher**
	Final Clarifiers - new splitter box and 2 new 72' units. Demolish older tanks, keep newest.	**Reviewer:**	**T. Allbaugh**
	[X] Conceptual [ ] Preliminary [ ] Final	**Installed:**	**1981, 1999**

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
1	**Demolition**				
	Existing clarifiers	1	LS	$300,000.00	$300,000.00
	Splitter boxes	1	LS	$30,000.00	$30,000.00
	Piping removal	350	FT	$200.00	$70,000.00
2	**Sitework**				
	Excavation & Hauling	3	CY	$151,000.00	$453,000.00
	Outlet combination box	1	LS	$50,000.00	$50,000.00
	Outlet Piping	1	LS	$164,000.00	$164,000.00
	Dewatering	1	LS	$20,000	$20,000.00
	Rock blasting/removal	1	LS	$25,000	$25,000.00
3	**Process**				
	New splitter box				
	Concrete	1	LS	$43,000.00	$43,000.00
	Weirs	2	EA	$7,500.00	$15,000.00
	Piping	1	LS	$108,000.00	$108,000.00
	Existing clarifier				
	Concrete	1	EA	$40,000.00	$40,000.00
	Weirs	1	EA	$35,000.00	$35,000.00
	Mechanism uprades	1	EA	$40,000.00	$40,000.00
	New clarifiers				
	Stamford Baffle	2	EA	$38,000.00	$76,000.00
	Effluent Baffle	2	EA	$52,000.00	$104,000.00
	60-foot dia. FST Mechanism	2	EA	$799,000.00	$1,598,000.00
	16" Influent Pipe underneath tank	2	LS	$71,000.00	$142,000.00
	Sludge Valve Vault pipe & fittings	2	LS	$45,000.00	$90,000.00
	6" Sludge piping underneath tank	2	LS	$23,000.00	$46,000.00
	Concrete encasement	2	LS	$23,000.00	$46,000.00
	Sludge Valve Vault valves (SV-1 thru SV-4)	4	EA	$6,000.00	$24,000.00
	Concrete	2	LS	$593,000.00	$1,186,000.00
	Misc. Metals	1	LS	$78,000.00	$78,000.00
	Control Panel	3	LS	$36,000.00	$108,000.00
	Site Lighting	1	LS	$23,000.00	$23,000.00
	Underground conduit (3-1")	3	LS	$56,000.00	$168,000.00
	Electrical and Instrumentation 25%	1	LS	$28,750.00	$30,000.00
	Mechanical 15%	1	LS	$17,250.00	$20,000.00
				Sub-total	$5,132,000.00
	CONTRACTUAL REQUIREMENTS				
	General Conditions	10%			$758,000
	General Requirements	5%			$379,000
				TOTAL CONSTRUCTION COST	$6,269,000
	Contingencies	30%			$1,881,000
	PROJECT COSTS				
	Engineering, construction eng., contract admin.	25%			$1,567,250
	Finance and Legal	5%			$314,000
	Utility Service and Connections for equipment		LS		$30,000
	ENGINEER'S OPINION OF PROJECT COST				**$10,100,000**

Alternative 2
Project Summary
Engineer's Opinion of Probable Project Costs

Owner:	**City of St Louis**	**Date:**	**2/23/2023**
Project:	**WWTP Master Plan**	**Project No.**	**0182-22-0010**
Work:	**WWTP Improvements**	**Prepared By:**	**P. Fletcher**
	Final Clarifiers - new splitter box and 3 new 60' unit. Demolish all existing.	**Reviewer:**	**T. Allbaugh**
	[X] Conceptual [ ] Preliminary [ ] Final	**Installed:**	**1981, 1999**

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
1	**Demolition**				
	Existing clarifiers	1	LS	$400,000.00	$400,000.00
	Splitter boxes	1	LS	$30,000.00	$30,000.00
	Piping removal	400	FT	$200.00	$80,000.00
2	**Sitework**				
	Excavation & Hauling	3	CY	$214,000.00	$642,000.00
	Outlet combination box	1	LS	$50,000.00	$50,000.00
	Outlet Piping	1	LS	$164,000.00	$164,000.00
	Dewatering	1	LS	$20,000	$20,000.00
	Rock blasting/removal	1	LS	$25,000	$25,000.00
3	**Process**				
	New splitter box				
	Concrete	1	LS	$43,000.00	$43,000.00
	Weirs	2	EA	$7,500.00	$15,000.00
	Piping	1	LS	$108,000.00	$108,000.00
	New clarifiers				
	Stamford Baffle	3	EA	$38,000.00	$114,000.00
	Effluent Baffle	3	EA	$52,000.00	$156,000.00
	60-foot dia. FST Mechanism	3	EA	$799,000.00	$2,397,000.00
	16" Influent Pipe underneath tank	3	LS	$71,000.00	$213,000.00
	Sludge Valve Vault pipe & fittings	3	LS	$45,000.00	$135,000.00
	6" Sludge piping underneath tank	3	LS	$23,000.00	$69,000.00
	Concrete encasement	3	LS	$23,000.00	$69,000.00
	Sludge Valve Vault valves (SV-1 thru SV-4)	6	EA	$6,000.00	$36,000.00
	Concrete	3	LS	$794,000.00	$2,382,000.00
	Misc. Metals	1	LS	$78,000.00	$78,000.00
	Control Panel	3	LS	$36,000.00	$108,000.00
	Site Lighting	1	LS	$23,000.00	$23,000.00
	Underground conduit (3-1")	3	LS	$56,000.00	$168,000.00
	Electrical and Instrumentation 25%	1	LS	$28,750.00	$30,000.00
	Mechanical 15%	1	LS	$17,250.00	$20,000.00
				Sub-total	$7,575,000.00
	CONTRACTUAL REQUIREMENTS				
	General Conditions	10%			$758,000
	General Requirements	5%			$379,000
				TOTAL CONSTRUCTION COST	$8,712,000
	Contingencies	30%			$2,614,000
	PROJECT COSTS				
	Engineering, construction eng., contract admin.	25%			$2,178,000
	Finance and Legal	5%			$436,000
	Utility Service and Connections for equipment		LS		$30,000
	ENGINEER'S OPINION OF PROJECT COST				**$14,000,000**

Activated Sludge Alternative 1 (1/2)
Project Summary
Engineer's Opinion of Probable Project Costs

OHM Advancing Communities
Engineering Advisors

Owner:	**City of St Louis**	**Date:**	**2/23/2023**
Project:	**WWTP Master Plan**	**Project No.**	**0182-22-0010**
Work:	**WWTP Improvements**	**Prepared By:**	**P. Fletcher**
	Bio Selector Tank Addition	**Reviewer:**	**T. Allbaugh**
	[X] Conceptual [ ] Preliminary [ ] Final	**Installed:**	**2013**

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
2	**Sitework**				
	Excavation and Hauling	1	LS	$23,000.00	$23,000.00
	Piping	1	LS	$156,000.00	$156,000.00
	Access & grating	1	LS	$16,000.00	$16,000.00
	Miscellaneous	1	LS	$5,000.00	$5,000.00
3	**Process**				
	New Tank - 50 x 27 x 16				
	Structure	1	LS	$453,000.00	$453,000.00
	Internal baffles for both tanks	1	LS	$228,000.00	$228,000.00
	Mixers	2	EA	$69,000.00	$138,000.00
	Mud valve and drain piping	1	LS	$41,000.00	$41,000.00
	Existing tank				
	Retrofit baffles	1	LS	$179,200.00	$179,200.00
	Relocate mixers and power	2	LS	$7,500.00	$15,000.00
	Open up connecting wall between old and new tanks	1	LS	$10,000.00	$10,000.00
	Mud valve and drain piping	1	LS	$41,000.00	$41,000.00
	Electrical and Instrumentation 25%	1	LS	$59,425.00	$60,000.00
	Mechanical 15%	1	LS	$35,655.00	$40,000.00
				Sub-total	$1,405,200.00
	CONTRACTUAL REQUIREMENTS				
	General Conditions	10%			$141,000
	General Requirements	5%			$70,000
				TOTAL CONSTRUCTION COST	$1,616,200
	Contingencies	30%			$485,000
	PROJECT COSTS				
	Engineering, construction eng., contract admin.	25%			$404,050
	Finance and Legal	5%			$81,000
	Utility Service and Connections for equipment		LS		$5,000
	ENGINEER'S OPINION OF PROJECT COST				**$2,600,000**

Activated Sludge Alternative 1 (2/2)
Project Summary
Engineer's Opinion of Probable Project Costs

OHM Advancing Communities
Engineering Advisors

Owner:	**City of St Louis**	**Date:**	**2/23/2023**
Project:	**WWTP Master Plan**	**Project No.**	**0182-22-0010**
Work:	**WWTP Improvements**	**Prepared By:**	**P. Fletcher**
	Addition of New Oxidation Ditch	**Reviewer:**	**T. Allbaugh**
	[X] Conceptual [ ] Preliminary [ ] Final	**Installed:**	**2013**

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
1	**Demolition**				
				$0.00	$0.00
2	**Sitework**				
	Miscellaneous materials	1	LS	$25,000.00	$25,000.00
	Splitter box	1	LS	$522,000.00	$522,000.00
3	**Process**				
	Oxidation ditch				
	Proprietary equipment (rotors, drives)	2	EA	$239,500.00	$479,000.00
	Oxidation ditch concrete	1	LS	$2,529,000.00	$2,529,000.00
	Access stair and landing for existing ditch	1	LS	$100,000.00	$100,000.00
	Replacement brushes on existing drives	2	EA	$40,000.00	$80,000.00
	Electrical and Instrumentation 25%	1	LS	$745,875.00	$750,000.00
	Mechanical 15%	1	LS	$447,525.00	$450,000.00
				Sub-total	$5,010,000.00
	CONTRACTUAL REQUIREMENTS				
	General Conditions	10%			$501,000
	General Requirements	5%			$251,000
				TOTAL CONSTRUCTION COST	$5,762,000
	Contingencies	30%			$1,729,000
	PROJECT COSTS				
	Engineering, construction eng., contract admin.	25%			$1,441,000
	Finance and Legal	5%			$289,000
	Utility Service and Connections for equipment		LS		$25,000
	ENGINEER'S OPINION OF PROJECT COST				**$9,300,000**

Activated Sludge Alternative 2 (1/2)
Project Summary
Engineer's Opinion of Probable Project Costs

OHM Advancing Communities
Engineering Advisors

Owner:	**City of St Louis**	**Date:**	**2/23/2023**
Project:	**WWTP Master Plan**	**Project No.**	**0182-22-0010**
Work:	**WWTP Improvements**	**Prepared By:**	**P. Fletcher**
	Bio Selector Tank Addition	**Reviewer:**	**T. Allbaugh**
	[X] Conceptual [ ] Preliminary [ ] Final	**Installed:**	**2013**

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
2	**Sitework**				
	Excavation and Hauling	1	LS	$23,000.00	$23,000.00
	Piping	1	LS	$156,000.00	$156,000.00
	Access & grating	1	LS	$16,000.00	$16,000.00
	Miscellaneous	1	LS	$5,000.00	$5,000.00
3	**Process**				
	New Tank - 50 x 27 x 16				
	Structure	1	LS	$453,000.00	$453,000.00
	Internal baffles for both tanks	1	LS	$228,000.00	$228,000.00
	Mixers	2	EA	$69,000.00	$138,000.00
	Mud valve and drain piping	1	LS	$41,000.00	$41,000.00
	Existing tank				
	Retrofit baffles	1	LS	$179,200.00	$179,200.00
	Relocate mixers and power	2	LS	$7,500.00	$15,000.00
	Open up connecting wall between old and new tanks	1	LS	$10,000.00	$10,000.00
	Mud valve and drain piping	1	LS	$41,000.00	$41,000.00
	Electrical and Instrumentation 25%	1	LS	$59,425.00	$60,000.00
	Mechanical 15%	1	LS	$35,655.00	$40,000.00
				Sub-total	$1,405,200.00
	CONTRACTUAL REQUIREMENTS				
	General Conditions	10%			$141,000
	General Requirements	5%			$70,000
				TOTAL CONSTRUCTION COST	$1,616,200
	Contingencies	30%			$485,000
	PROJECT COSTS				
	Engineering, construction eng., contract admin.	25%			$404,050
	Finance and Legal	5%			$81,000
	Utility Service and Connections for equipment		LS		$5,000
	ENGINEER'S OPINION OF PROJECT COST				**$2,600,000**

Activated Sludge Alternative 2 (2/2)
Project Summary
Engineer's Opinion of Probable Project Costs

OHM Advancing Communities
Engineering Advisors

Owner:	**City of St Louis**	**Date:**	**2/23/2023**
Project:	**WWTP Master Plan**	**Project No.**	**0182-22-0010**
Work:	**WWTP Improvements**	**Prepared By:**	**P. Fletcher**
	Modifications to Existing Oxidation Ditch	**Reviewer:**	**T. Allbaugh**
	[X] Conceptual [ ] Preliminary [ ] Final	**Installed:**	**2013**

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
1	**Sitework**				
	Excavation and Hauling	1	LS	$25.00	$84,790.81
2	**Structural**				
	New Splitter Box - 6 x 6 x 8H				
	Base slab	1	LS	$1,200.00	$4,800.00
	Walls	1	LS	$800.00	$17,100.00
	Splitter box	1	LS	$470,400.00	$470,400.00
3	**Process**				
	Existing tank				
	Proprietary equipment (rotors, drives)	2	EA	$239,500.00	$479,000.00
	Proprietary control equipment updates	1	LS	$75,000.00	$75,000.00
	Access stair and landing for existing ditch	1	LS	$100,000.00	$100,000.00
	Electrical and Instrumentation 25%	1	LS	$103,625.00	$110,000.00
	Mechanical 15%	1	LS	$62,175.00	$70,000.00
				Sub-total	$1,567,090.81
	CONTRACTUAL REQUIREMENTS				
	General Conditions	10%			$157,000
	General Requirements	5%			$78,000
				TOTAL CONSTRUCTION COST	$1,802,091
	Contingencies	30%			$541,000
	PROJECT COSTS				
	Engineering, construction eng., contract admin.	25%			$450,523
	Finance and Legal	5%			$91,000
	Utility Service and Connections for equipment		LS		$10,000
	ENGINEER'S OPINION OF PROJECT COST				**$2,900,000**

Alternative 1
Project Summary
Engineer's Opinion of Probable Project Costs

Owner:	**City of St Louis**	**Date:**	**2/23/2023**
Project:	**WWTP Master Plan**	**Project No.**	**0182-22-0010**
Work:	**WWTP Improvements**	**Prepared By:**	**P. Fletcher**
	Disinfection - Expand existing tank, replace with hypochlorite	**Reviewer:**	**T. Allbaugh**
	[X] Conceptual [ ] Preliminary [ ] Final	**Installed:**	**1981**

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
1	**Demolition**				
	Demolish existing tank wall	1	LS	$96,000.00	$96,000.00
2	**Sitework**				
	Excavation	1	LS	$20,000.00	$20,000.00
	Block Building	750	SQ FT	$200.00	$150,000.00
	Miscellaneous	1	LS	$10,000.00	$10,000.00
3	**Process**				
	Excavation and Hauling	1	LS	$47,000.00	$47,000.00
	Piping	1	LS	$106,000.00	$106,000.00
	Concrete work - walls	1	LS	$159,000.00	$159,000.00
	Concrete work - baffle walls	1	LS	$61,000.00	$61,000.00
	Chlorination equipment (bulk tanks, day tank)	2	LS	$29,000.00	$58,000.00
	Chlorination equipment (metering pumps)	1	LS	$47,000.00	$47,000.00
	Bulk storage tank containment walls	1	LS	$182,000.00	$182,000.00
	Upgrade sodium bisulfite dechlorination equipment	1	LS	$78,000.00	$78,000.00
	Miscellaneous	1	LS	$26,250.00	$27,000.00
	Electrical	1	LS	$144,750.00	$145,000.00
		Sub-total for contact tank expansion			$1,186,000.00
	CONTRACTUAL REQUIREMENTS				
	General Conditions	10%			$119,000
	General Requirements	5%			$59,000
		TOTAL CONSTRUCTION COST			$1,364,000
	Contingencies	30%			$410,000
	PROJECT COSTS				
	Engineering, construction eng., contract admin.	25%			$341,000
	Finance and Legal	5%			$69,000
	Utility Service and Connections for equipment		LS		$10,000
	ENGINEER'S OPINION OF PROJECT COST				**$2,200,000**

Alternative 2
Project Summary
Engineer's Opinion of Probable Project Costs

Owner:	**City of St Louis**	**Date:**	**2/23/2023**
Project:	**WWTP Master Plan**	**Project No.**	**0182-22-0010**
Work:	**WWTP Improvements**	**Prepared By:**	**P. Fletcher**
	Disinfection - Remove existing system, install UV in new building	**Reviewer:**	**T. Allbaugh**
	[X] Conceptual [ ] Preliminary [ ] Final	**Installed:**	**1981**

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
1	**Demolition**				
	Backfill chlorine contact tank and remove chlorine room equipment	1	LS	$53,000.00	$53,000.00
2	**Sitework**				
	Excavation and Hauling for UV systems	1	LS	$11,000.00	$11,000.00
	Piping and Chambers	1	LS	$138,000.00	$138,000.00
	Miscellaneous	1	LS	$10,000.00	$10,000.00
3	**Process**				
	New enclosed UV system	3	EA	$285,600.00	$856,800.00
	Building	625	SQ FT	$175.00	$110,000.00
	Building platform, stairs and electrical	1	LS	$570,000.00	$570,000.00
	Piping	1	LS	$163,000.00	$163,000.00
	Valves	1	LS	$37,000.00	$37,000.00
	Concrete work	1	LS	$141,000.00	$141,000.00
	Miscellaneous	1	LS	$227,750.00	$227,800.00
	Electrical	1	LS	$85,680.00	$85,700.00
		Sub-total for new, enclosed UV system			$3,039,300.00
	CONTRACTUAL REQUIREMENTS				
	General Conditions	10%			$304,000
	General Requirements	5%			$152,000
		TOTAL CONSTRUCTION COST			$3,495,300
	Contingencies	30%			$1,049,000
	PROJECT COSTS				
	Engineering, construction eng., contract admin.	25%			$874,000
	Finance and Legal	5%			$175,000
	Utility Service and Connections for equipment		LS		$25,000
	ENGINEER'S OPINION OF PROJECT COST				**$5,600,000**

Alternative 1
Project Summary
Engineer's Opinion of Probable Project Costs

Owner:	**City of St Louis**	**Date:**	**2/23/2023**
Project:	**WWTP Master Plan**	**Project No.**	**0182-22-0010**
Work:	**WWTP Improvements**	**Prepared By:**	**P. Fletcher**
	Grit System - Replace Existing with 1 larger unit	**Reviewer:**	**T. Allbaugh**
	[X] Conceptual [ ] Preliminary [ ] Final	**Installed:**	**1999**

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
1	**Demolition**				
	Existing single vortex removal, channels	1	LS	$50,000.00	$50,000.00
2	**Sitework**				
	Piping and Chambers	1	LS	$15,000.00	$15,000.00
	Excavation and Hauling	3,700	CU YD	$40.00	$148,000.00
	Overpumping	1	LS	$50,000.00	$50,000.00
3	**Process**				
	Vortex grit removal				
	17' diam Vortex removal system	1	LS	$483,000.00	$483,000.00
	Grit handling				
	Grit handling re-build	1	LS	$129,000.00	$129,000.00
	Grit discharge/dumpster	1	LS	$111,000.00	$111,000.00
	Upsteam and downstream channels	1	LS	$41,000.00	$41,000.00
	Electrical and Instrumentation 25%	1	LS	$180,750.00	$190,000.00
	Mechanical 15%	1	LS	$108,450.00	$110,000.00
				Sub-total	$1,327,000.00
	CONTRACTUAL REQUIREMENTS				
	General Conditions	10%			$133,000
	General Requirements	5%			$66,000
		TOTAL CONSTRUCTION COST			$1,526,000
	Contingencies	30%			$458,000
	PROJECT COSTS				
	Engineering, construction eng., contract admin.	25%			$381,500
	Finance and Legal	5%			$77,000
	Utility Service and Connections for equipment		LS		$5,000
	ENGINEER'S OPINION OF PROJECT COST				**$2,500,000**

Alternative 2
Project Summary
Engineer's Opinion of Probable Project Costs

Owner:	**City of St Louis**	**Date:**	**2/23/2023**
Project:	**WWTP Master Plan**	**Project No.**	**0182-22-0010**
Work:	**WWTP Improvements**	**Prepared By:**	**P. Fletcher**
	Grit System - Add to Existing with 1 identical unit	**Reviewer:**	**T. Allbaugh**
	[X] Conceptual [ ] Preliminary [ ] Final	**Installed:**	**1999**

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
1	**Demolition**				
	Channel downstream of existing unit			$55,000.00	$55,000.00
2	**Sitework**				
	Piping and Chambers	1	LS	$34,000.00	$34,000.00
	Excavation and Hauling	800	CU YD	$40.00	$32,000.00
	Overpumping	1	LS	$20,000.00	$20,000.00
	Additional concrete work	1	LS	$15,000.00	$15,000.00
3	**Process**				
	Vortex grit removal				
	Vortex removal system	1	LS	$483,000.00	$483,000.00
	Grit handling				
	Grit handling area re-build	1	LS	$22,000.00	$22,000.00
	Grit discharge/dumpster	2	LS	$22,000.00	$44,000.00
	Upsteam and downstream channels	1	LS	$86,000.00	$86,000.00
	Electrical and Instrumentation 25%	1	LS	$131,750.00	$140,000.00
	Mechanical 15%	1	LS	$79,050.00	$80,000.00
				Sub-total	$1,011,000.00
	CONTRACTUAL REQUIREMENTS				
	General Conditions	10%			$101,000
	General Requirements	5%			$51,000
		TOTAL CONSTRUCTION COST			$1,163,000
	Contingencies	30%			$349,000
	PROJECT COSTS				
	Engineering, construction eng., contract admin.	25%			$290,750
	Finance and Legal	5%			$59,000
	Utility Service and Connections for equipment		LS		$5,000
	ENGINEER'S OPINION OF PROJECT COST				**$1,900,000**

Alternative 1
Project Summary
Engineer's Opinion of Probable Project Costs

Owner:	**City of St Louis**	**Date:**	**2/23/2023**
Project:	**WWTP Master Plan**	**Project No.**	**0182-22-0010**
Work:	**WWTP Improvements**	**Prepared By:**	**P. Fletcher**
	New Solids Handling in New Building	**Reviewer:**	**T. Allbaugh**
	[X] Conceptual [ ] Preliminary [ ] Final	**Installed:**	**1981, 1999**

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
1	**Demolition**				
	Removal of Chlorination equipment	1	LS	$10,000.00	$10,000.00
	Removal of serpentine walls	1	LS	$50,000.00	$50,000.00
	Backfilling of chlorine contact tank	1	LS	$35,000.00	$40,000.00
	Removal of anaerobic digestion equipment	1	LS	$100,000.00	$100,000.00
2	**Sitework**				
	Excavation and Hauling	1	LS	$3,000.00	$3,000.00
	Building	750	SF	$175.00	$132,000.00
	Exterior Piping	500	LF	$500.00	$250,000.00
	Miscellaneous (sloping floor, drain and pump)	1	LS	$25,000.00	$25,000.00
	Concrete slab	1	LS	$600,000.00	$600,000.00
3	**Process**				
	New Facility				
	Platform and stairs	1	LS	$100,000.00	$100,000.00
	Interior Piping and valves	1	LS	$500,000.00	$500,000.00
	Feed pumps	2	EA	$25,000.00	$80,000.00
	Volute dewaterer / screw press	2	EA	$581,500.00	$1,170,000.00
	Rotary Fan Press	2	EA	$339,200.00	$680,000.00
	Access platform	1	LS	$40,000.00	$40,000.00
	Conveyor to transfer sludge for truck loading	55	LF	$2,000.00	$220,000.00
	Mechanical 15%	1	LS	$416,355.00	$420,000.00
	Electrical and Instrumentation 25%	1	LS	$693,925.00	$700,000.00
				Sub-total	$4,320,000.00
	CONTRACTUAL REQUIREMENTS				
	General Conditions	10%			$432,000
	General Requirements	5%			$216,000
				TOTAL CONSTRUCTION COST	$4,968,000
	Contingencies	30%			$1,491,000
	PROJECT COSTS				
	Engineering, construction eng., contract admin.	25%			$1,242,000
	Finance and Legal	5%			$249,000
	Utility Service and Connections for equipment		LS		$25,000
	ENGINEER'S OPINION OF PROJECT COST				**$8,000,000**

Alternative 1A
Project Summary
Engineer's Opinion of Probable Project Costs

Owner:	**City of St Louis**	**Date:**	**2/23/2023**
Project:	**WWTP Master Plan**	**Project No.**	**0182-22-0010**
Work:	**WWTP Improvements**	**Prepared By:**	**P. Fletcher**
	New Solids Handling in Existing Chlorine Contact Tank	**Reviewer:**	**T. Allbaugh**
	[X] Conceptual [ ] Preliminary [ ] Final	**Installed:**	**1981, 1999**

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
1	**Demolition**				
	Removal of Chlorination equipment	1	LS	$10,000.00	$10,000.00
	Removal of serpentine walls	1	LS	$50,000.00	$50,000.00
	Removal of anaerobic digestion equipment	1	LS	$100,000.00	$100,000.00
2	**Sitework**				
	External Piping	150	LF	$500.00	$80,000.00
	Miscellaneous (sloping floor, drain and pump)	1	LS	$15,000.00	$20,000.00
3	**Process**				
	Sludge dewatering				
	Feed pumps	2	EA	$25,000.00	$80,000.00
	Volute dewaterer / screw press	1	EA	$581,500.00	$1,170,000.00
	Polymer dosing system	2	EA	$32,400.00	$130,000.00
	Access platform	1	LS	$40,000.00	$40,000.00
	Conveyor to transfer sludge for truck loading	55	LF	$2,000.00	$110,000.00
	Electrical and Instrumentation 25%	1	LS	$170,225.00	$180,000.00
	Mechanical 15%	1	LS	$127,668.75	$130,000.00
				Sub-total	$1,930,000.00
	CONTRACTUAL REQUIREMENTS				
	General Conditions	10%			$193,000
	General Requirements	5%			$97,000
		TOTAL CONSTRUCTION COST			$2,220,000
	Contingencies	30%			$666,000
	PROJECT COSTS				
	Engineering, construction eng., contract admin.	25%			$555,000
	Finance and Legal	5%			$111,000
	Utility Service and Connections for equipment		LS		$5,000
	ENGINEER'S OPINION OF PROJECT COST				**$3,600,000**

Alternative 2
Project Summary
Engineer's Opinion of Probable Project Costs

Owner:	**City of St Louis**	**Date:**	**2/23/2023**
Project:	**WWTP Master Plan**	**Project No.**	**0182-22-0010**
Work:	**WWTP Improvements**	**Prepared By:**	**P. Fletcher**
	Existing Solids Handling, More Storage	**Reviewer:**	**T. Allbaugh**
	[X] Conceptual [ ] Preliminary [ ] Final	**Installed:**	**1981, 1999**

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
1	**Demolition**				
	Removal of Chlorination equipment	1	LS	$10,000.00	$10,000.00
	Removal of serpentine walls	1	LS	$50,000.00	$50,000.00
2	**Sitework**				
	Excavation and Hauling	1	LS	$3,000.00	$10,000.00
	External Piping	500	LF	$500.00	$250,000.00
	Miscellaneous (sloping floor, drain and pump)	1	LS	$15,000.00	$20,000.00
	Adjacent equipment building	400	SF	$175.00	$70,000.00
3	**Process**				
	New storage				
	55' diam. steel tank with cover (450,000 gallon)	1	LS	$738,400.00	$740,000.00
	Tank foundation	1	LS	$300,000.00	$300,000.00
	Pumps	1	LS	$40,000.00	$40,000.00
	Piping and valves	1	LS	$60,000.00	$60,000.00
	Concrete slab	3,600	SF	$800.00	$2,880,000.00
	Mechanical 15%	1	LS	$666,000.00	$670,000.00
	Electrical and Instrumentation 25%	1	LS	$1,127,500.00	$1,130,000.00
				Sub-total	$6,230,000.00
	CONTRACTUAL REQUIREMENTS				
	General Conditions	10%			$623,000
	General Requirements	5%			$312,000
				TOTAL CONSTRUCTION COST	$7,165,000
	Contingencies	30%			$2,150,000
	PROJECT COSTS				
	Engineering, construction eng., contract admin.	25%			$1,791,250
	Finance and Legal	5%			$359,000
	Utility Service and Connections for equipment		LS		$10,000
	ENGINEER'S OPINION OF PROJECT COST				**$11,500,000**

APPENDIX C: PUBLIC MEETING DOCUMENTS

APPENDIX 2: NOTICE OF PROJECT PLANNING PUBLIC MEETING

(To be used as Template)

The (Name of Applicant) will hold a public meeting on the proposed (description) project for the purpose of receiving comments from interested persons.

The meeting will be held at _____ p.m. on (Date) at (Location).

The purpose of the proposed project is _____

_____

_____

Project construction will involve _____

_____

_____

Impacts of the proposed project include _____

_____

_____

The estimated cost to users for the proposed project will be _____

_____

Copies of the plan detailing the proposed project are available for inspection at the following location(s): _____

_____

Written comments received before the meeting record is closed on (Date and Time) will receive responses in the final project planning document. Written comments should be sent to: _____

APPENDIX D: SUBMITTAL FORM AND RESOLUTION FOR CWSRF PROJECT

APPENDIX 3: SAMPLE RESOLUTION

A RESOLUTION ADOPTING A FINAL PROJECT PLANNING DOCUMENT

FOR WASTEWATER SYSTEM IMPROVEMENTS OR

NPS POLLUTION CONTROL/STORMWATER IMPROVEMENTS

AND DESIGNATING AN AUTHORIZED PROJECT REPRESENTATIVE

WHEREAS, the _____(legal name of applicant)_____ recognizes the need to make improvements to its existing wastewater treatment and collection system or its existing NPS pollution control/stormwater treatment system; and

WHEREAS, the _____(legal name of applicant)_____ authorized _____(name of consulting engineering firm)____ to prepare a Project Planning Document, which recommends the construction of _____

_____

WHEREAS, said Project Planning Document was presented at a Public Hearing held on _____(Date and Time)____ and all public comments have been considered and addressed.

NOW THEREFORE BE IT RESOLVED, that the _____(legal name of applicant)_____ formally adopts said Project Planning Document and agrees to implement the selected alternative _____(Selected Alternative Description)_____

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

Yeas (names of Members voting Yes):

Nays (names of Members voting No):

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

BY: _____ _____

Name (please print or type) Title

_____ _____

Signature Date

APPENDIX E: FISCAL SUSTAINABILITY CERTIFICATION FORM

Fiscal Sustainability Plan Certification Form

Describe SRF Project to be Funded: OR SRF Project Number _____

Address needed improvements to the City of St Louis Sanitary System including reconstruction of the sewer along Main, Saginaw, and River Court, improvements to the Union Street Pump Station, and the construction of a force main from the Union Street PS to the WWTP.

Check one box below:

☒ FSP does not apply because:

- ☐ The project is for a new treatment works system.
- ☒ The project involves an upgrade that does not involve repair/replacement or expansion of a treatment works system.
- ☐ The project is for nonpoint source work.
- ☐ Other (explain)

☐ FSP is complete for the SRF-funded project and is available for review by contacting:

_____
(Name) (Phone)

_____

_____

I certify that the City of St. Louis (Applicant's Name) has developed and implemented a plan that meets the requirements of Section 603(d)(1)(E)(i) of the Water Resources Reform and Development Act of 2014. The FSP includes an inventory of critical assets, an evaluation of the condition and performance of inventoried assets, a plan for maintaining, repairing, and as necessary, replacing the treatment works, and a plan for funding such activities. The applicant also certifies that the water and energy conservation efforts have been evaluated and will be implemented.

KEITH W. RISDON, P.E., DIRECTOR OF PUBLIC SERVICES
Name and Title of Authorized Representative *(Please Print or Type)*

Keith W. Risdon MARCH 31, 2023
Signature of Authorized Representative Date