Lansing Board of Water & Light
Drinking Water State Revolving Fund
Project Plan

Project No. 180593

July 1, 2021

fishbeck

Engineers | Architects | Scientists | Constructors

fishbeck
Engineers | Architects | Scientists | Constructors

5913 Executive Drive, Suite 100
Lansing, Michigan 48911

517.882.0383 | fishbeck.com

Lansing Board of Water & Light
Drinking Water State Revolving Fund
Project Plan

Prepared For:
Lansing Board of Water & Light

July 1, 2021
Project No. 180593

Table of Contents

List of Figures

List of Tables

List of Appendices

List of Abbreviations/Acronyms

ACO	Administrative Consent Order
AWWA	American Water Works Association
BWL	Lansing Board of Water & Light
CaCO3	calcium carbonate
CSO	combined sewer overflow
DWSRF	Drinking Water State Revolving Fund
EGLE	Michigan Department of Environment, Great Lakes, and Energy
GIS	Geographic Information System
MGD	million gallons per day
SESC	soil erosion and sedimentation controls
SSO	sanitary sewer overflow
WCP	Water Conditioning Plant

1.0 Introduction

This Project Plan was prepared on behalf of the Lansing Board of Water & Light (BWL) in Lansing, Michigan to obtain a Drinking Water State Revolving Fund (DWSRF) loan from the Michigan Department of Environment, Great Lakes, and Energy (EGLE). The loan is for construction of water main improvements in correlation with the City of Lansing's 2019-2023 Wet Weather Control Plan for Combined Sewer Overflow (CSO)/ Sanitary Sewer Overflow (SSO) control. This DWSRF Project Plan will focus on the projects scheduled for construction in 2022 and 2023. These projects include:

1. Water main improvements within Lansing CSO Subareas 034D, 034E, and 015S

The estimated DWSRF eligible cost for these projects is $19.2 Million. The proposed improvements will replace aging water main, valves, associated fire hydrants and appurtenances located within the City of Lansing's Combined Sewer Separation Areas to improve water quality and reliability and to improve flow efficiency and public health protection.

2.0 Project Background

2.1 Delineation of Study Area

The BWL, which is located in Lansing, Michigan, is a regional system supplying water to the City of Lansing and a large portion of the surrounding community. The study area includes the BWL service area. The water system supplies water for 208,909 retail and wholesale customers. The retail customers include the entire City of Lansing, and portions of Alaiedon Township, Bath Township, City of Dewitt, Delhi Township, Dewitt Township, Lansing Township, Watertown Township and Windsor Township. The wholesale customers include Lansing Township West Side Water, Delta Township and the East Lansing Meridian Water & Sewer Authority (feed to south side of Meridian Township). Figure 1 illustrates the BWL service area. Figure 2 presents the major water system components, including water treatment facilities and booster stations.

2.2 Land Use in Study Area

The existing land use in the study area varies greatly from agriculture, residential to heavy residential and industrial. All of the Townships and Cities have residential located within. The townships all contain some agricultural use. City of Dewitt, East Lansing and Lansing all contain commercial and mixed use. Delta Township, Delhi Township, Windsor Township and City of Lansing also contain industrial areas. The City of Lansing metropolitan area, in which the proposed project is located, is the industrial, commercial, and institutional center for central Michigan. Major existing commercial areas are located along arterial roadways, including Cedar Street, Martin Luther King Jr Boulevard, Pennsylvania, Washington, and Michigan Avenues, and in the Central Business District. Industrial areas are located along South Washington Avenue, east of Pennsylvania Avenue in southeast Lansing, between I-496 and the Grand River, along Sunset Avenue and North Grand River Avenue, and along the Larch/Cedar Streets corridor from the Grand River north to the corporate limits.

Public and institutional properties are distributed across the City, with a concentration in the core downtown area. Single and multifamily residential properties and parks fill out most of the remaining areas. Future land use and development is generally expected to parallel existing use, while moving toward implementation of Smart Growth principles such as: development of existing communities, mixed land uses, walkable neighborhoods, and preservation of open space. Land use across the study area can be seen in Figure 3.

2.3 Population Projections

The City of Lansing's 2010 population, in which the proposed project is located, was reported at 114,297 by the U.S Census Bureau. This was down approximately 4% from 119,100 recorded in the 2000 census, and down by

just over 10% compared to the 127,321 population recorded in the 1990 census. Michigan is projected to gain population at a modest rate of approximately 0.1% per year during the period 2010-2040 (*The Economic and Demographic Outlook for Michigan*, March 2012, Institute for Research on Labor, Employment and the Economy, University of Michigan), and Ingham County is expected to slightly exceed Michigan's projected growth rate. The Tri-County Regional Transportation Plan estimates an annual growth rate of 0.4% for the 2010-2040 period. Table 1 shows the 2010 census population for all of the communities that the BWL services, and projected population over the next 5, 10 and 20 years. It should be noted that this represents the population of the entire jurisdictional boundary and may not reflect the BWL service territory.

Table 1 – BWL Water Service Area Population Projections

	Census Population	Project Planning Period Calculated Population (5 yr, 10 yr, 20 yr)		
Unit of Government	2010	2015	2020	2030
Alaiedon Township	2,894	2,954	3,014	3,134
Bath Township	11,598	11,828	12,058	12,518
City of Dewitt	4,507	4,597	4,687	4,867
City of Lansing	114,297	116,582	118,867	123,437
Delhi Township	25,877	26,397	26,917	27,957
Dewitt Township	14,321	14,606	14,891	15,461
Lansing Township – Retail	8,126	8,291	8,456	8,786
Meridian Township	39,688	40,483	41,278	42,868
Watertown Township	4,836	4,931	5,026	5,216
Windsor Township	6,838	6,973	7,108	7,378
Wholesale – Lansing Twp				
Wholesale – Delta Twp	32,408	33,058	33,708	35,008
Wholesale – ELMWSA				

2.4 Water Demand

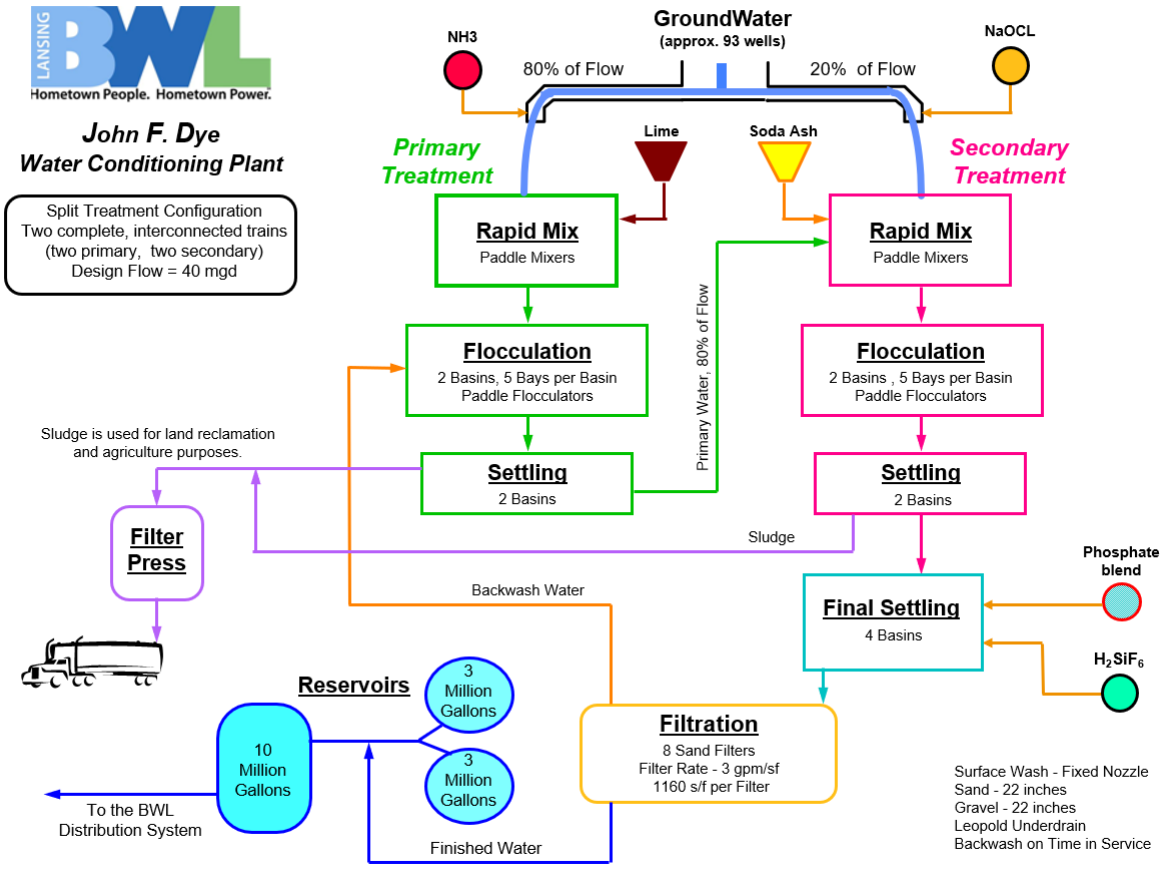
The existing project areas are comprised of residential, commercial, and industrial properties. The proposed project areas are largely built out, and not much growth is expected.

2.5 Existing Facilities

The BWL water supply utilizes groundwater from the Saginaw Aquifer, delivered in varying amounts by deep rock wells located throughout the greater Lansing area. BWL has 125 wells that are either in active or out of service status, with 7 of those wells are owned by Lansing Township West Side Water. Wells that are out of service are for routine maintenance or reduced water usage during the winter. All wells are connected by a system of raw water transmission mains to either the Dye Water Conditioning Plant (WCP) or the Wise Road WCP.

The Dye WCP was built in 1939 with a rated capacity of 30 million gallons per day (MGD). In 1949, the plant was expanded to 40 MGD, due to an increase in demand. Current treatment consists of two-stage split treatment softening, granular media filtration, and chloramine disinfection. Approximately 80% of the incoming groundwater undergoes excess lime treatment at pH above 11 in the primary treatment basins to precipitate calcium and magnesium hardness as calcium carbonate (CaCO3) and magnesium hydroxide (Mg(OH)2),

respectively. The primary treatment train is comprised of two rapid mix basins, two flocculation basins (five bays each, each containing paddle flocculators), and two settling basins. Ammonia is added to the primary basin influent line, and lime is added at the primary rapid mix stage. After water is passed through rapid mix, it flows into the flocculation basins where, through the five bays, flocs form and grow in size as they progress towards the settling basins. In the settling basins, these flocs settle out and get transferred to the sludge thickening system and the clean water overflows to secondary treatment. Settled water from the primary basins is blended with untreated groundwater (approximately 20% of the incoming flow) prior to entering the secondary treatment basins to reduce the pH of the blended water and to maintain a pH of approximately 9.5 in the finished water leaving the plant. This reduced pH also promotes precipitation of excess lime as CaCO3 within the secondary settling basins. Sodium hypochlorite and fluoride are added to the secondary basin influent line, and soda ash is added at the rapid mix stage of the secondary train. The effluent from the secondary basins flows to final settling prior to the sand filters. A polyphosphate/orthophosphate chemical blend is added to the final settling basins as a scale inhibitor in the filters and a corrosion inhibitor in the distribution system. The backwash pump supplies water to clean the filters. The filter effluent flow is transmitted to one of three finished water reservoirs, which supply flow to the high-service pumping stations. This facility has two high-service pumping stations, Dye High Lift and Cedar Pumping Station, which operate simultaneously and pump water to the distribution system. Dye High Lift contains three high service pumps (and one filter backwash pump) and Cedar contains four high service pumps (Pump 1 is directly wired to the generator and Pump 4 is not operable). The residual backwash water is sent to the cistern and then reintroduced at the head of the plant. Sludge from the thickener underflow is processed through a filter press and hauled off-site for land application and/or reclamation, while the residual water is conveyed to the head of the primary basins. The below schematic shows the treatment process through the Dye WCP.



The Wise WCP was constructed in 1966 in the southern portion of Lansing, Michigan. It has a design capacity of 10 MGD. Current treatment consists of two-stage split treatment softening, granular media filtration, and chloramine disinfection. The general treatment processes are the same as at Dye WCP, but on a smaller scale. This plant generally receives water from 21 wells dedicated to this plant, and BWL can send water to Wise from an additional 23 wells, depending on demand. Just as at Dye, the raw water is split, 80% primary and 20% secondary in which each train consists of two rapid mix basins, two flocculation basins, and two settling basins. The remainder of the process mimics that at Dye, ending at four sand filters and finished water piped to a reservoir on site. The high service pumping station contains four pumps, which pump water to the distribution system. The Wise WCP does not contain any solids processing equipment; the solids are pumped nearly seven miles to the Dye WCP for processing.

The BWL has storage at both of its WCPs and at one of its booster stations. The amount of available storage is shown in Table 2 below.

Table 2 – Water Storage

Location Description	Volume
Dye/Cedar North 3.5	3.5 MG
Dye/Cedar South 3.5	3.5 MG
Dye/Cedar East 10.0	10.0 MG
Wise WCP	5.0 MG
Hulett	2.0 MG
Total	**24.0 MG**

The BWL has high service pumping at both of its WCPs and owns and operates 5 booster stations. Tables 3 and 4 show its pumping capacity at these sites.

Table 3 – High Service Pumping at WCPs

	Year Installed	Pump Number	Capacity (MGD)
Dye High Lift	1995	Pump 1	20.0
	1995	Pump 2	20.0
	1995	Pump 3	10.0
Cedar St		Pump 1 – Emergency Use	20.0
		Pump 2	12.5
		Pump 3	18.0
		Pump 4	15.0
Wise Rd		Pump 1	5.0
		Pump 2	5.0
		Pump 3	10.0
		Pump 4	10.0

Table 4 – Distribution System Booster Stations

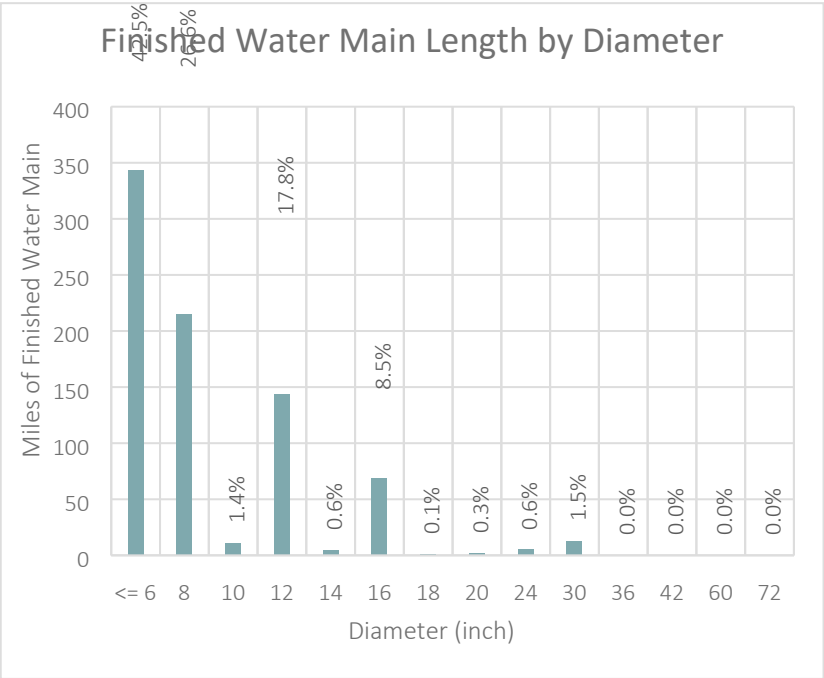
Location	Year Installed	Pump Number	Pump Install Year	Capacity (MGD)
Aurelius	1993	Pump 1	1993	6.3
Eifert	1973	Pump 1	1973	6.3
Windsor	2003	Pump 1 – Fire Pump	2003	2.8
	2003	Pump 2 – Fire Pump	2003	2.8
	2003	Pump 3	2003	0.2
	2003	Pump 4	2003	0.2
Hulett	2000	Pump 1	2000	2.5
	2000	Pump 2	2000	2.5
	2000	Pump 3	2000	2.5
	2000	Pump 4	2000	1.3
	2000	Pump 5	2000	0.6
	2000	Pump 6	2000	0.6
Watertown (Out of Service)		Pump 1		5.0
		Pump 2 (impeller removed)		0.0

The BWL owns and operates the raw water mains, finished water mains, and water services to the outlet side of the water meter including all other appurtenances that make up the distribution system such as booster pumping stations, water valves, hydrants, curb stop and boxes, etc.

The tables and figures below show a high-level overview of the age, material, and size of finished water mains within the BWL water distribution system.

Length of Finished Water Main by Pipe Diameter

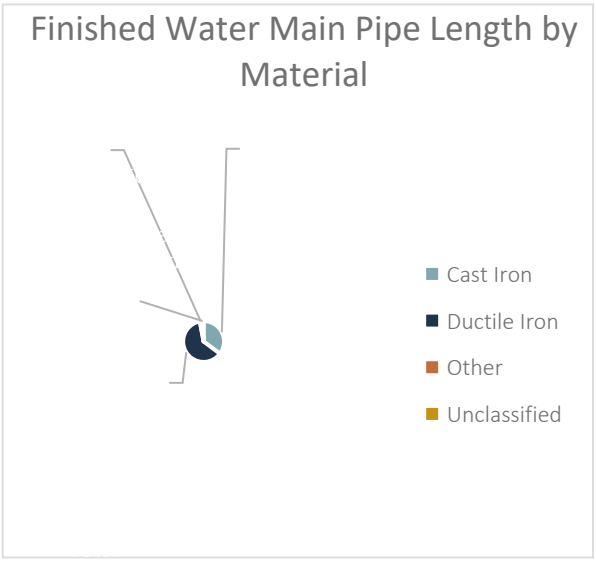
Type	Diameter (inch)	Length (miles)
Finished Water Main	<= 6-inch	343.30
	8-inch	215.05
	10-inch	11.15
	12-inch	143.94
	14-inch	4.48
	16-inch	68.80
	18-inch	1.13
	20-inch	2.24
	24-inch	5.14
	30-inch	12.50
	36-inch	0.04
	42-inch	0.11
	60-inch	0.00
	72-inch	0.07
Total Finished WM		807.95



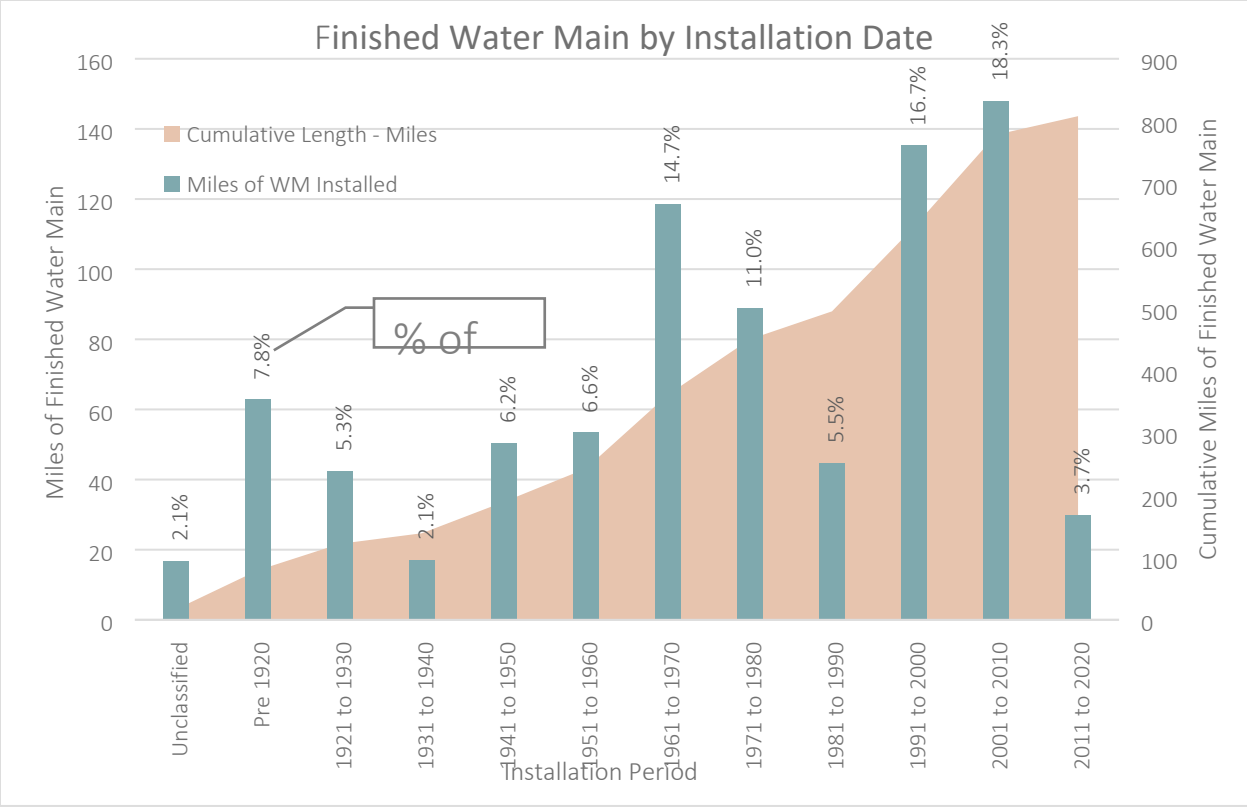
Length of Finished Water Main by Pipe Diameter

Finished Water Main Length by Material Type

Material	Percent of Total	Length (Miles)
Cast Iron	35.2%	284.7
Ductile Iron	61.8%	499.4
Other	1.4%	11.4
Unclassified	1.5%	12.4
Grand Total	100.0%	808.0



Finished Water Main Length by Material



Finished Water Main by Installation Date

The condition of water mains is currently being assessed based on the following criteria.

- Pipe age
- Number of main breaks, main breaks per 100 miles per year by pipe "category" and by pipe segment
- C factor, hydraulic deficiencies
- Available fire flow based on zoned land use
- Water quality related parameters

Pipe age can be an indicator for several criteria listed above. For example, aging unlined cast iron pipe will typically contribute to lower C factors, resulting in greater pumping energy used, increased maintenance and flushing, reduced fire flow, and faster degradation of chlorine residuals, increasing the likelihood of coliform bacteria outbreaks and nitrification. Excessive tuberculation of unlined cast iron pipe in the distribution system promotes bio-growth that in turn reduces chlorine residual. The reduction in chlorine frees up ammonia, creating food for nitrite oxidizing bacteria causing nitrification issues. Nitrification can reduce pH and alkalinity, decreasing the effectiveness of the corrosion control. As bio-growth increases, chemical dosages must also be increased to achieve the same disinfection and corrosion control results. Eventually, the deteriorating main could impair disinfection and corrosion control goals to the point that treatment technique requirements are not met, and water quality standard violations occur. By replacing older unlined cast iron pipe, BWL helps ensure that disinfection and corrosion control chemical costs are lowered, and public health protection remains intact. Unlined cast iron pipe was primarily used as the material of choice in the BWL water system until the late 1950s to early 1960s.

Typical Old Un-Lined Cast Iron Pipe

Main breaks are another driver for assessing the condition of the water system. The BWL spatially tracks main breaks within a database and analyzes patterns to better understand how pipes are performing. Main break data is ultimately input into a GIS based system and this data feeds into the capital improvement planning process as one of the criteria for likelihood of failure. Over the years, the BWL has recognized main break related patterns based on installation era and pipe material. The BWL currently analyzes main break related data based on the following categories, in addition to by pipe segment:

- "Landel" system – a community water system the BWL acquired, which is also unlined cast-iron pipe
- Cast iron pipes installed after 1945
- Cast iron pipes installed prior to 1945
- Ductile iron pipe

The "Landel" system, in terms of main breaks, has a higher likelihood of failing than any other category. This is followed by post-1945 installed cast iron pipe, pre-1945 installed cast iron pipe, and ductile iron. Ductile iron pipe has the least likelihood of failure of any pipe material in the BWL system.

The BWL has a capital improvement plan in place to replace aging infrastructure. The BWL has already replaced lead service lines. Additionally, the BWL coordinates with the City of Lansing and other jurisdictions to team up on projects that are mutually beneficial, saving on restoration costs and optimizing capital dollars.

Climate change has multiple potential impacts on water quality and water quantity. Therefore, it is important to consider and plan for these impacts. In the Great Lakes region, there has been an increase in storm intensity which has led to increased runoff from farms and cities, and flooding, which leads to more pollutants entering waterways and groundwater. In addition, there is more stress on the aquifer from fluctuating temperatures. Other items that can be affected are excessive frost penetration, resulting in water main breaks, pressure loss and associated coliform outbreaks. There is an increase in demands to prevent freezing services, and 1920s era water main tends to not meet current depth of bury standards that would prevent mains and services from freezing. The BWL has completed and certified completion of the Risk and Resilience Assessment, as well as the Emergency Response Plan, which was an all hazards approach evaluating risk to the system from malevolent acts and natural hazards. Natural hazards include items such as power outage (from things such as an ice storm or other), flood, tornado, earthquakes, and pandemics.

2.6 Summary of Project Need

The BWL is proposing to replace aging water main, valves, fire hydrants and appurtenances located within three of the City of Lansing's Combined Sewer Separation Areas. These CSO Areas are 034D, 034E and 015S. The City of Lansing is under an Administrative Consent Order (ACO) for their sewer system and Wastewater Treatment Plant to separate their system and reduce sanitary sewer overflows (SSOs). ACO-05153 was entered in on December 19, 2019. CSO Areas 034D, 034E and 015S are within the ACO and the first three projects to be completed on the schedule. The BWL and the City of Lansing work together on these projects to improve efficiencies, minimize disruption to customers, and to reduce costs. One of the cost benefits for completing the work together is that the City of Lansing shares in the restoration costs and traffic control.

The water main within the 034D area was originally constructed in the 1930s-1940s and is 80-90 years old. The 034E areas was constructed in the late 1910s, so approximately 110 years old. 015S was built between 1900-1925

and is approximately 100-120 years old. By replacing these watermains, the BWL will improve water quality and reliability for its customers. In addition, it will improve flow efficiency and ensure public health protection by reducing the likelihood of coliform outbreaks and nitrification.

2.6.1 Compliance with Drinking Water Standards

No court or enforcement orders, or written enforcement actions have been issued to the BWL regarding the water system.

2.6.2 Drinking Water Quality Problems

The BWL has recognized patterns with unlined cast iron pipes contributing to chlorine degradation over a much shorter period of time than cement lined ductile iron pipe. This can ultimately lead to additional water quality related problems in the distribution system such as nitrification and increased likelihood of coliform outbreaks. The BWL is addressing these issues through proactive water main replacement.

Delta Township, a wholesale customer of the BWL, performed a Level 1 Assessment due to excessive positive total coliform samples in 2018. The assessment can be seen in Appendix 2. Implementation of this project plan and replacement of unlined cast iron pipes (ie. Aging infrastructure) will ultimately improve water quality in the distribution system. There are no other known water quality concerns.

2.6.3 Projected Needs for the Next 20 Years

Over the next 20 years, the BWL is planning to ramp up water main replacement to address aging infrastructure within the distribution system. Below is a summary of the needs over the next 20 years related to water main replacement.

- There are currently 60 miles of water main in service that is over 100 years old in need of replacement.
- There will be an additional 60 miles of water main that will reach end of useful life over the next 20 years.
- The BWL has 50 miles of “Landel” pipes (a system that fails 7 times more frequently than the average pipe in the system) that is in need of replacement.
- The total of these three is 170 miles of pipe that needs to be replaced over the next 20 years. This is approximately 8.5 miles per year. By applying for DWSRF funding, the BWL is hoping they can ramp up water main replacement more quickly, since current rates cannot support this footage of replacement.

2.6.4 Other Planned Projects as part of BWL Capital Improvement Plan (CIP)

The BWL has several other projects within the existing 6-year CIP that were not submitted for funding as part of this DWSRF Project Plan but should be considered for scoring. Although these projects were not included in this Project Plan submittal, obtaining a low interest loan and potential principal forgiveness through the DWSRF process will allow the BWL to continue with the other planned projects and lessen the burden on existing rate payers. Below is a list of other planned capital improvements that are currently within the 6-year CIP.

Table 5 – Water Distribution Capital Budget

Description	6-Year Plan	Additional Details
Water – Domestic Services (1" or less) (BL 15)	$465,000	The BWL budgets to replace existing services on an annual basis. It should be noted that the BWL has replaced all active lead service lines. Capital dollars were allocated toward the lead service line replacement project from 2004 to 2016.
Water – Meters (BL 17)	$650,000	The BWL is in the process of implementing an Automated Metering Infrastructure project, which includes replacing all meters older than 2003 with solid state meters that are guaranteed not to lose accuracy. This will also provide customers a portal to better understand their daily water use, reduce unaccounted water, improve efficiency, and save energy.
Water – Service Replacements (BL 18)	$1,200,000	The BWL replaces other non-standard service material on an annual basis. In many instances, these service replacements are leak related so replacing them would reduce unaccounted water, improve efficiency, and save energy.
Water – Street Reconstruction (BL 19)	$10,355,050	The BWL regularly participates with the City of Lansing to combine street improvements with water main replacement projects.
Water – System Improvements (BL 21)	$32,797,700	These projects include water main replacement, large meter set replacements, and valve replacements that are performed outside of planned street improvement and CSO project areas. Pressure Boundary Modification – improve reliability and improve water quality due to changing hydraulic conditions.
*Water – CSO System Improvement (BL 22)	$23,831,100	This project plan includes $19.2M of the $23.8M planned over the next 6 years.

* Included in this project plan for loan assistance

Table 6 – Water Production Capital Budget

Project Description	6-Year Plan	Additional Details
Dye/Cedar Dry Chemical Handling	$6,091,352	Enhance existing dry chemical system to replace aged or ineffective equipment. Includes lining lime silos to allow for full use of storage capacity without rat holing, avalanching, piling, and cave ins. Replacement of problematic slakers and soda ash machines, and installation of bin vents to improve dust issues above storage silos. Increase efficiency, reduce chemical costs, save energy, and improve safety and reliability.
Dye – Convert Ammonia Systems to Aqueous Form	$1,580,000	This will be a major safety improvement at the Dye water conditioning plant.
Dye Filter 10 Installation	$1,185,000	Equip existing filter basin to provide increased filter capacity and plant reliability.
Dye Filter Controls Upgrade	$995,000	Replace current control system that is no longer supported technically or materially. Will align control system with current plant control system. Will also improve reliability of filter system and runs allowing better optimization of backwash cycles and saving energy.

Table 6 – Water Production Capital Budget

Project Description	6-Year Plan	Additional Details
Cedar Pump 4 Replacement	$850,000	Replacement of obsolete pump with new pump that is sized to better suit current pumping conditions and demands. Improve pump efficiency, save energy, improve reliability.
Dye – Pump Room Refurbishment	$780,000	Refurbish Dye pump room consisting of painting process piping, replacement of head tank pump, resurfacing deteriorated floor, new lighting and reclaim and cistern pump replacement.
Dye Mezzanine Electrical Replacement	$750,000	Replace old transformers to increase reliability within WCP and increase efficiency and save energy costs.
Dye Exterior Upgrades	$740,000	Repair damage to existing exterior surfaces resulting from water infiltration. Includes roof drainage repairs to stop future damage.
Wise Chemical Building	$690,000	New chemical storage/dosing facility to relocate chemicals from existing occupied building to non-occupied building. Improve operator safety, security, public health, improve efficiency, save energy.
Dye Sludge Transfer Pumps 1 and 2 replacement	$688,000	Sludge disposal is a critical process for the BWL. This project will replace critical assets that are required as part of the sludge disposal process. Improve pump efficiency, save energy, improve reliability.
Hulett Controls Upgrade	$600,000	Upgrade current aged system to be better aligned with system used in operations. Improve reliability.
Dye Process Pump Replacement	$520,000	Improve pump efficiency, save energy, improve reliability, improve water quality and protect public health.
Water – Well and Well Field Facilities (BL 25)	$465,000	The BWL performs improvements to wells on an annual basis. Improve water quality and protect public health, improve efficiency and reliability, reduce electrical consumption.
Dye Thickener Refurbishment	$410,000	Repair damage to thickener resulting from normal use over time. Will consist of metal repairs, concrete repairs, and painting.
Wise Grounds Upgrades	$370,000	Repair existing site infrastructure consisting of paving, storm sewer, fencing for security, lighting and new paving for chemical delivery station. Improve Safety and reliability.
Water – Basin Upgrades (BL 24)	$345,000	The BWL performs basin upgrades on an annual basis.
Water – Instrumentation Upgrades (BL 23)	$305,000	The BWL budgets and plans for instrumentation upgrades on an annual basis. Improve reliability, energy savings, etc.
Water – Equipment Removal (BL 26)	$201,000	The BWL performs removal of miscellaneous obsolete equipment within its WCPs and Well System.
Dye – Cedar Facilities Restoration	$200,000	Repair and restore Cedar Pump Facility exterior walls to ensure longevity and structural integrity.
Wise Holding Tank Refurbishment	$190,000	Repair and clearing of sludge holding tank to allow for increased reliability of treatment process and sludge handling. Improve reliability.
Dye Fluoride System Replacement	$184,000	The BWL is in the process of finishing a project related to the Fluoride system at Dye Water. The majority of the expenses related to this project has been done. Protect public health, improve reliability, prevent overfeed.

Table 6 – Water Production Capital Budget

Project Description	6-Year Plan	Additional Details
Dye – HSW Booster Pump Supply #2	$110,000	Replacement of existing House Service Water pump which supplies service water to Dye WCP Improve pump efficiency, save energy, improve reliability.
Water – Raw Water Supply Mains (BL 50)	$90,000	The BWL performs upgrades on its raw water transmission mains on an annual basis. Improve reliability, save energy.
New Well	$85,000	Replacement of capacity lost during abandonment of a well during construction project. Improve reliability, upgrade controls, energy savings.
Wellfield Asset Management	$50,000	
Lab Equipment Improvements		The Environmental Laboratory will be purchasing a 4551A Cooling Unit for the GC-Mass Spec's autosampler. This method will improve the integrity of the samples and will allow the BWL to analyze for more analytes that could be emergent contaminants. This method will also allow greater flexibility to improve the efficiency of the data.

3.0 Analysis of Alternatives

3.1 No Action

The "No Action" alternative is not acceptable. The City of Lansing must proceed with work in the areas included in this Project Plan to meet the requirements of their ACO. The water main must be replaced, as it has reached its useful life expectancy. BWL must consider water main replacement while the road is open to capitalize on efficiencies and to address the aging infrastructure. In addition, no action will also result in water quality issues from aging infrastructure, which will eventually result in violation notices from EGLE relating to drinking water standards.

3.2 Optimum Performance of Existing Facilities

Improving the performance of the existing facilities is not an acceptable alternative. The system that is to be addressed is the water distribution system. The system is aging and has met its useful life. If the system is not replaced, the system will experience more frequent water main breaks along with water quality issues that could result in violations of the drinking water standards.

3.3 Regional Alternatives

There is not a viable regional alternative. The BWL is the regional water supply. They service multiple communities across mid-Michigan including those that neighbor the City of Lansing where the proposed projects are located.

4.0 Principal Alternatives

The proposed projects are similar within three different neighborhoods in the City of Lansing. Aging water main will be replaced with new pipe along with valves, fire hydrants and appurtenances. The proposed work falls within the CSO 034D, 034E and 015S areas. Most of the proposed water main will be 8-inch, with some 16-inch proposed within 015S along Martin Luther King Jr. Boulevard. The 034D project is generally bounded by Pattengill Avenue on the west, Cooper Avenue on the north, Martin Luther King Jr Boulevard on the east, and Dunlap Street

on the south. 034D will replace approximately 14,000 feet of water main. The 034E project is generally bounded by South Washington Avenue on the west, Mount Hope Avenue on the north, Forest Avenue on the east, and Greenlawn Avenue on the south. 034E will replace approximately 7,100 feet of water main. The 015S project is generally bounded by Saginaw Street to the north, Sycamore Street to the east, Ottawa Street to the south, and Verlinden Avenue to the west. 015S will replace approximately 31,400 feet of water main. Figure 4 shows the project locations.

Three alternatives were considered for the water main replacement:

Alternative 1 – Open Cut Replacement with CSO

Alternative 2 – Open Cut Replacement without CSO

Alternative 3 – Replacement through Directional Drill

4.1 Monetary Evaluation

4.1.1 034D Project

A detailed breakdown of the costs for the 034D water main replacement by open cut and directional drilling is presented in Appendix 1. Table 7 provides the monetary evaluation of the two alternatives.

Based on the results of the monetary evaluation, Alternative 1 is the most cost effective.

Table 7 – 034D Project Monetary Evaluation

		Alternative 1		Alternative 2		Alternative 3	
		Water Main Open Cut with CSO		Water Main Open Cut without CSO		Water Main Directional Drill	
Improvements	Life	Cost	Salvage*	Cost	Salvage*	Cost	Salvage*
Water Main	50 yrs	$3,642,765	$2,185,659	$4,501,245	$2,700,747	$5,572,365	$3,343,419
Hydrants & Valves	50 yrs	$194,500	$77,800	$194,500	$77,800	$194,500	$77,800
Equipment	20 yrs	$0	$0	$0	$0	$0	$0
Total Construction Cost		$3,837,265		$4,695,745		$5,766,865	
Engineering and Contingencies		$1,362,735		$1,704,255		$2,033,135	
Easements & Land Acquisition		$0	$0	$0	$0	$0	$0
Present Worth Estimated Capital Costs		$5,200,000		$6,400,000		$7,800,000	
Salvage Value at 20 Years			$2,263,459		$2,778,547		$3,421,219
Present Worth of Salvage Value**			$2,502,137		$3,071,540		$3,781,980
Total Annual O&M Costs		$2,000		$2,000		$2,000	
Present Worth of O&M Costs***		$42,179		$42,179		$42,179	
Total Present Worth of Project (Capital + O&M + Salvage)		**$2,740,043**		**$3,370,640**		**$4,060,199**	

* Salvage value at the end of 20 years planning period is computed on the basis of straight line depreciation over the life of the item
Discount Rate (i) = -0.500%
Years (n) = 20
** Future Salvage Value to Present Worth Multiplier = 1.105
*** Annual O&M to Present Worth Multiplier = 21.090
Present Worth to Annual Multiplier = 0.04741666

4.1.2 034E Project

A detailed breakdown of the costs for the 034E water main replacement by open cut and directional drilling is presented in Appendix 1. Table 8 provides the monetary evaluation of the two alternatives.

Based on the results of the monetary evaluation, Alternative 1 is the most cost effective.

Table 8 – 034E Project Monetary Evaluation

		Alternative 1		Alternative 2		Alternative 3	
		Water Main Open Cut with CSO		Water Main Open Cut without CSO		Water Main Directional Drill	
Improvements	Life	Cost	Salvage*	Cost	Salvage*	Cost	Salvage*
Water Main	50 yrs	$1,861,955	$1,117,173	$2,382,875	$1,429,725	$2,827,365	$1,696,419
Hydrants & Valves	50 yrs	$90,000	$36,000	$90,000	$36,000	$90,000	$36,000
Equipment	20 yrs	$0	$0	$0	$0	$0	$0
Total Construction Cost		$1,951,955		$2,472,875		$2,917,365	
Engineering and Contingencies		$748,045		$927,125		$1,082,635	
Easements & Land Acquisition		$0	$0	$0	$0	$0	$0
Present Worth Estimated Capital Costs		$2,700,000		$3,400,000		$4,000,000	
Salvage Value at 20 Years			$1,153,173		$1,465,725		$1,732,419
Present Worth of Salvage Value**			$1,274,773		$1,620,283		$1,915,099
Total Annual O&M Costs		$1,000		$1,000		$1,000	
Present Worth of O&M Costs***		$21,090		$21,090		$21,090	
Total Present Worth of Project (Capital + O&M – Salvage)		**$1,446,317**		**$1,800,807**		**$2,105,990**	

* Salvage value at the end of 20 years planning period is computed on the basis of straight line depreciation over the life of the item
Discount Rate (i) = -0.500%
Years (n) = 20
** Future Salvage Value to Present Worth Multiplier = 1.105
*** Annual O&M to Present Worth Multiplier = 21.090
Present Worth to Annual Multiplier = 0.04741666

4.1.3 015S Project

A detailed breakdown of the costs for the 015S water main replacement by open cut and directional drilling is presented in Appendix 1. Table 9 provides the monetary evaluation of the two alternatives.

Based on the results of the monetary evaluation, Alternative 1 is the most cost effective.

Table 9 – 015S Project Monetary Evaluation

Improvements	Life	Alternative #1 Water Main Open Cut with CSO		Alternative #2 Water Main Open Cut without CSO		Alternative #3 Water Main Directional Drill	
		Cost	Salvage*	Cost	Salvage*	Cost	Salvage*
Water Main	50 yrs	$7,864,050	$4,718,430	$10,672,815	$6,403,689	$12,540,420	$7,524,252
Hydrants & Valves	50 yrs	$457,500	$183,000	$457,500	$183,000	$457,500	$183,000
Equipment	20 yrs	$0	$0	$0	$0	$0	$0
Total Construction Cost		$8,321,550		$11,130,315		$12,997,920	
Engineering and Contingencies		$2,978,450		$3,969,685		$4,602,080	
Easements & Land Acquisition		$0	$0	$0	$0	$0	$0
Present Worth Estimated Capital Costs		$11,300,000		$15,100,000		$17,600,000	
Salvage Value at 20 Years			$4,901,430		$6,586,689		$7,707,252
Present Worth of Salvage Value**			$5,418,277		$7,281,243		$8,519,968
Total Annual O&M Costs		$4,000		$4,000		$4,000	
Present Worth of O&M Costs***		$84,359		$84,359		$84,359	
Total Present Worth of Project (Capital + O&M – Salvage)		**$5,966,082**		**$7,903,115**		**$9,164,391**	

* Salvage value at the end of 20 years planning period is computed on the basis of straight line depreciation over the life of the item
Discount Rate (i) = -0.500%
Years (n) = 20
** Future Salvage Value to Present Worth Multiplier = 1.105
*** Annual O&M to Present Worth Multiplier = 21.090
Present Worth to Annual Multiplier = 0.04741666

4.2 Environmental Evaluation

4.2.1 Cultural Resources

The proposed improvements for all three projects are in previous construction areas and within the City of Lansing road rights-of-way (ROWs). There are no historical sites or archaeological sites in the vicinity of the project.

4.2.2 The Natural Environment

4.2.2.1 Climate

The proposed work will not be affected by climate, nor have an influence on the climate. The project will be designed to operate in the prevailing climate/ environment.

4.2.2.2 Air Quality

The proposed work will have no significant effect on the local air quality. Heavy equipment used for construction will temporarily increase fugitive dust emissions in work areas but is not expected to produce a significant or lasting effect. Fugitive dust will be temporary during construction and will be mitigated for the duration of the project with appropriate soil erosion and sedimentation controls (SESC) measures.

4.2.2.3 Wetlands

Most of the project area has been urbanized, and only small, scattered, unregulated wetlands remain. These are not significant in size and are not directly associated with the major surface water bodies. There are no regulated wetlands in the proposed project work areas.

4.2.2.4 Coastal Zones

There are no coastal zones in the project area.

4.2.2.5 Floodplains

A map illustrating the 100-year floodplain is included as Figure 5. There is not any proposed work in the floodplain.

4.2.2.6 Natural or Wild and Scenic Rivers

There are no State designated wild or scenic rivers in the project area.

4.2.2.7 Major Surface Waters

Figure 1 presents the overall study area and major surface waters, including the Grand and Red Cedar Rivers, and Sycamore Creek.

4.2.2.8 Agricultural Resources

There are no prime agricultural resources in areas of proposed work.

4.2.2.9 Fauna and Flora

According to the U.S. Fish and Wildlife Service website, the Indiana Bat is the only possible endangered species in the project area. Indiana Bats are found over most of the eastern half of the United States. Almost half of them hibernate in caves in southern Indiana. They hibernate during winter in caves or, occasionally, in abandoned mines. During summer, they roost under the peeling bark of dead and dying trees. Indiana Bats eat a variety of flying insects found along rivers or lakes and in uplands.

The Northern long-eared bat is a possible threatened species in the project area. Northern long-eared bats hibernate in caves and mines. They swarm in surrounding wooded areas in autumn. The bats roost and forage in upland forests during spring and summer.

The proposed project includes sewer and water main work in established road ROWs and developed urban areas. If any tree removal is necessary during construction, it will be completed between November 15 and March 31 to comply with bat restrictions. Consideration will also be taken for migratory birds if nesting areas may be impacted by the project.

4.3 Mitigation

Mitigation of environmental impacts will include best construction practices such as soil erosion prevention techniques and maintenance of construction equipment. Air quality will be controlled to the greatest extent possible by limiting construction to regular working hours during the week. All disturbances will be as narrow as practical to get the project completed.

4.4 Implementability and Public Participation

The water main will be replaced within the existing road ROW and locations will be limited based on placement of the new sanitary sewer, the existing combined sewer and the existing water main. The existing system is left in place, if possible, during construction so temporary water services do not need to be used. The Fire Marshall will be given an opportunity to evaluate fire hydrant placement to ensure adequate coverage of all properties within

the project areas. The Public will be given a chance to review the projects during the public review period prior to the public hearing.

4.5 Technical Considerations

The alternatives evaluated in this project plan will comply with Act 399 and be designed to meet the standard recommended guidelines in the "Recommended Standards for Waterworks" as published by the Great Lakes and Upper Mississippi Board of State Sanitary Engineers. In addition, both alternatives will meet and maintain compliance with applicable water quality standards.

4.6 Residuals

The alternatives evaluated will not influence residuals. The existing project areas are well established neighborhoods within the City of Lansing. There are not any high-volume users that will affect design flows and pressures. It is anticipated that the existing consumer base will remain similar to what it currently is today, and the proposed water distribution system improvements will help maintain necessary pressures and water quality and reduce flushing.

4.7 Contamination

At the beginning of each water distribution system improvement project that the BWL completes, a detailed review of available data related to potential contamination is conducted. At the beginning of the design of a new CSO area, a Preliminary Environmental Corridor Study (PECS) is completed. Past activities within these project areas are evaluated. The State of Michigan's list of contaminated sites is reviewed in detail as well. In some cases, where the PECS has flagged certain areas, environmental soil borings will be taken to further understand the impact of past activities. The borings will characterize soils in order to properly dispose of in a designated, approved landfill. Viton gaskets and clay dams will be utilized based on contamination found in the project area. Each project included in this project plan will be evaluated for contamination at the beginning of design.

4.8 New/ Increased Water Withdrawals

This project plan does not include any new or increased surface or groundwater withdrawal. The proposed projects should reduce leaks, reduce breaks, and reduce lost water within the City of Lansing.

5.0 Selected Alternative

The selected alternative is to replace water main throughout the Lansing CSO 034D, 034E and 015S project areas through open cut construction methods. This would be Alternative 1.

5.1 Design Parameters

The three proposed water main projects are briefly described below and are illustrated in Figures 6-8.

5.1.1 CSO Subarea 034D

The 034D project area will replace approximately 14,000 feet of 8-inch water main. In addition to water main replacement, valves, fire hydrants and appurtenances will be replaced.

5.1.2 CSO Subarea 034E

The 034E project area will replace approximately 7,100 feet of 8-inch water main. In addition to water main replacement, valves, fire hydrants and appurtenances will be replaced.

5.1.3 CSO Subarea 015S

The 015S project area will replace approximately 29,700 feet of 8-inch water main and 1,700 16-inch water main. In addition to water main replacement, valves, fire hydrants and appurtenances will be replaced.

5.1.4 Sizing Factors

The BWL utilizes several industry guidelines for water main sizing.

- Michigan Safe Drinking Water Act 1976 PA 399
- Recommended Standards for Water Works – Latest Edition
- Suggested Practice for Water Works Design, Construction, and Operation for Type I Public Water Supplies
- AWWA Standards
- Other guidance documents as referenced in the above standards

Based on the above referenced documents, below is the typical criteria used by the BWL for sizing water mains.

- Sized based on calibrated hydraulic model and analysis.
- Maintain minimum of 35psi at all points in the distribution during all demand conditions including peak hour.
- Maintain 20psi in the distribution system under max day demands including high flows and flushing.

Additionally, the BWL requires that newly installed pipe be of a standard pipe size, which shall include 8-inch, 12-inch, 16-inch, 24-inch, and 30-inch.

For residentially zoned areas, the minimum pipe size for water distribution mains is typically 8-inch. However, smaller diameter mains may be acceptable in residentially zoned areas, if approved by a BWL Engineer. For example, a 6-inch main may be acceptable in residential areas that are highly looped, or to maintain water quality with low turnover.

For commercially zoned areas, the minimum pipe size for water distribution mains shall be 8-inch.

5.2 Maps

The proposed water main replacement within the Lansing CSO 034D, 034E and 015S areas will be completed by open cut construction. Figures 6, 7 and 8 show the proposed route and sizes of the water distribution system projects.

5.3 Schedule for Design and Construction

The proposed project schedule is detailed below.

Drinking Water Revolving Fund Proposed Schedule

		2021												2022												2023												2024												2025											
		01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10	11	12
1 Submit Draft Project Plan to EGLE	May 2021																																																												
2 Hold Public Hearing	June 2021																																																											
3 Pass Resolution Adopting Project	June 2021																																																										
4 Submit Final Project Plan Amendment to EGLE	July 1, 2021																																																										
5 CSO Subarea 034D Water Main Replacement	**2nd Quarter 2022**																																																									
Submit Plans and Specifications to EGLE	November 2021																																																									
Bid Opening	January 2022																																																									
Receive DWSRF Loan	April 2022																																																									
Begin Construction	April 2022																																																									
Complete Construction	November 2023																																																									
6 CSO Subarea 034E Water Main Replacement	**2nd Quarter 2023**																																																									
Submit Plans and Specifications to EGLE	November 2022																																																									
Bid Opening	February 2023																																																									
Receive DWSRF Loan	April 2023																																																									
Begin Construction	April 2023																																																									
Complete Construction	November 2023																																																									
7 CSO Subarea 015S Water Main Replacement	**2nd Quarter 2023**																																																									
Submit Plans and Specifications to EGLE	November 2022																																																									
Bid Opening	February 2023																																																									
Receive DWSRF Loan	April 2023																																																									
Begin Construction	April 2023																																																									
Complete Construction	November 2025																																																									

5.4 Cost Estimate

These estimated costs for the proposed water main replacement projects consist of engineering design, administrative and legal costs, and construction. The estimated costs are summarized in Table 10 below.

Table 10 – Cost Estimate

Subarea	Open Cut	Open Cut w/out CSO	Directional Drill
034D	$5,200,000	$6,400,000	$7,800,000
034E	$2,700,000	$3,400,000	$4,000,000
015S	$11,300,000	$15,100,000	$17,600,000

5.5 User Costs

The BWL's water distribution projects recommended in this Project Plan are targeted for low interest loan assistance through the DWSRF program. The availability of loan funds is dependent on annual appropriations and the placement of the projects on the Priority List prepared annually by EGLE.

BWL rates are developed based on cost of service studies to recover the operations, maintenance, depreciation, and interest expenses that benefit the water utility's customers. Based on the project plan, the cost to customers is $0.35 per month (see Table 11, below). This cost excludes potential principal forgiveness for the Non-Lead Drinking Water Infrastructure grant and the Disadvantaged Communities program, which could result in a net savings to BWL customers compared to other financing options available.

For reference, the average monthly residential user in the BWL system consumes 5 CCF per month. 1 CCF is 100 cubic feet of water, or 748 gallons.

Table 11 – Monthly Residential Bill Impact

Subareas	034D, 034E, 015S
Current Average Residential Bill	$32.86
Monthly Adjustment	$0.35
Adjusted Average Residential Bill	$33.21

5.6 Disadvantaged Community

The disadvantaged community qualification is determined for each loan that is applied for by the community. For some loans, the community may qualify as disadvantaged, while for other loans it may not, depending on the projects included in the specific loan and the users that the projects impact.

The BWL is considered disadvantaged by EGLE. The completed determination worksheet was submitted with the Intent to Apply form.

5.7 Ability to Implement the Selected Alternative

The BWL is a regional utility that owns and operates the system within the City of Lansing. They do not own the systems for every community for which they provide water. For some of the municipalities, they operate the water systems, some they supply the water, and for some communities they serve as a inter-connection to be able to supply emergency water. The BWL has substantial experience in the financing and execution of capital improvements under a variety of programs. Since they own the system within the City of Lansing, there is not a need to revise any agreements. The BWL will be the loan applicant for the proposed projects.

6.0 Environmental Evaluation

6.1 Historical/ Archaeological/ Tribal Resources

The construction of the proposed project should have no effect on historical, archaeological or cultural resources. All construction activities will occur within the existing road ROW and where there has been previous ground disturbance. This project plan is not requiring a THPO or a SHPO review.

6.2 Water Quality

Surface water and groundwater quality should not be impacted by construction. It is anticipated that all construction activities will occur within existing road ROW. Ten States Standards will be followed during design, and an Act 399 Water Permit will be obtained from EGLE at the end of design to ensure that we are meeting all drinking water standards. The BWL is a member of the City of Lansing Wellhead Protection Team and maintains a current EGLE approved Wellhead Protection Program Plan. The BWL internally reviews all proposed construction projects to ensure a healthy water system and to ensure they are following their Wellhead Protection Program Plan.

6.3 Land/ Water Interface

Sensitive features such as floodplains, wetlands, stream crossings, coastal areas, and prime or unique agricultural lands will not be disturbed by the proposed projects. The projects will be occurring in urban areas within developed areas. Figure 5, 9 and 10 depicts the locations of floodplains, wetlands, and surface waters in respect to the proposed projects.

6.4 Endangered Species

Federal and/ or State threatened, or endangered species or state special concern species of flora or fauna will not be impacted by the proposed projects. The projects will be occurring in developed areas within road ROW that has already been disturbed by past construction activity. Care will be taken to meet bat requirements if tree removal is a necessity, and to avoid nesting areas of migratory birds. A biological survey is not required for this project plan.

6.5 Agricultural Land

The location of prime farmland with respect to the proposed projects is depicted in Figure 11.

6.6 Social/ Economic Impact

There will be no effective displacement of employment opportunities that would cause social/ economic impacts within the study area. The proposed projects will improve quality of life for the customers and will create some operational positions as the projects are a significant infrastructure investment within the community.

6.7 Construction/ Operational Impact

There will be temporary impact to the air quality during construction due to the construction equipment, fuel consumption, and exhaust. These impacts will include the discharge of carbon monoxide and other chemical byproducts of the operation of the construction equipment. There are no other air quality degradation items considered in the project plan.

The impact to the natural settings will be minimized during construction. The natural settings will not be impacted by operations of the water system after the project is completed.

Care will be taken to minimize tree removal during construction. During design, tree location will be analyzed and if it is unavoidable, new trees will be planted in their place following construction.

Traffic will be impacted during construction. Traffic control or detour routes will be put into place, depending on the construction location. Residents will be able to access their homes and businesses during construction.

There will be significant consumption of materials in the construction phase of the project. This includes raw materials, fuel, food, and man-hours to construct the new water main. Operational impacts will include energy consumption. Noise and odor from the new construction will be controlled through regular maintenance.

Fugitive dust will be temporary during construction and will be mitigated for the duration of the project.

6.8 Indirect Impacts

Following construction, the project sites will be restored back to original condition, consistent with all City of Lansing requirements. With the exception of the new valve structures and fire hydrants required for system maintenance, the project will not be identifiable from ground level. Therefore, it is unlikely that the project will result in any inadvertent side effects.

7.0 Mitigation Measures

7.1 General

In locations where adverse impacts cannot be avoided, mitigation methods will be implemented. The anticipated adverse impacts are to be minimal, and mostly limited to the construction of the proposed projects.

7.2 Short Term Construction Related Mitigation

Short term environmental impacts are related primarily to construction of the projects outlined in the project plan. The designated construction will include specific mitigation efforts of any short-term environmental impacts including:

7.2.1 Noise and Odor

Construction operations will be limited to hours set by the City of Lansing as part of their noise ordinance. Odor and fugitive dust will be kept to minimum using soil erosion and sedimentation control procedures/permit established in the project plans and specifications. Standard methods for fugitive dust control such as water and/ or calcium chloride applications will be used during construction and restoration of vegetation.

7.2.2 Traffic Control

Traffic safety will be handled by proper signage and detour routes governed by permits from the City of Lansing and MDOT. In locations where construction interferes with the normal use of existing roads, temporary traffic facilities will be provided. Facilities for local traffic, pedestrian, and vehicular ingress and egress, approved by the Engineer, will be provided at all times for the properties adjacent to the work. For through traffic, the special provisions and/ or plans will designate whether the existing roads will be closed with detours, temporary roads, and run-arounds provided, or whether two-way traffic will be maintained through all or portions of the construction area.

7.2.3 Soil Erosion and Sedimentation Control

Soil erosion and sedimentation control (SESC) will be guided by BWL SESC Program/Procedures and standard techniques prescribed by permits. Construction operations will be conducted in a manner to reduce erosion and sedimentation to a practical minimum. Temporary and/ or permanent sedimentation controls will be constructed, to the extent possible, prior to commencing operations. Grading operations will immediately follow grubbing

operations; otherwise temporary erosion and sedimentation controls may be required between successive construction stages. Sediment traps, sandbags, silt fences, plastic sheets, erosion control fences, and weirs will be some of the temporary sedimentation controls used during this project. Procedures and details will be included in the project plans and specifications for each project.

7.2.4 Excavated Areas

All excavated roads will be repaved with an asphalt surface, concrete surface, or natural gravel. All ditches and lawns will be reseeded and/ or sodded. Care will be taken to remove only trees necessary for the construction, and only during periods allowed, to comply with bat restrictions. Vegetation that is removed as part of the construction will be replaced as required by City of Lansing ordinance. Any surplus or waste material resulting from construction will be properly handled, stored, and/ or disposed of in an approved disposal site. Restoration and replacement of disturbed roads, vegetation, and utilities will be included as bid items in the contract documents. The route of the water main has been chosen to avoid known environmentally sensitive areas as much as possible.

7.3 Mitigation of Long-Term Impacts

Careful restoration of street pavement would be required to ensure that it performs satisfactorily in the future. The aesthetic impacts of construction will be mitigated to some extent by site restoration.

The long-term effect of the short-term use of these resources will be to provide an improved water infrastructure and to ensure high water quality within the community.

7.4 Mitigation of Indirect Impacts

No significant secondary environmental impacts are expected to result from the implementation of this project plan. Only positive benefits are foreseen by the upgrade of the water system.

8.0 Public Participation

8.1 Public Hearing Advertisement

A public hearing on the Draft Project Plan was held on June 7, 2021. A public notice was published in the Lansing City Pulse on May 5, 2021, more than 30 days prior to the hearing. A copy of the proof of publication of the notice is included in Appendix 3.

8.2 Public Hearing Transcript

The public hearing was recorded. A copy of the recording has been shared with EGLE.

8.3 Public Hearing Contents

A copy of the power point presentation provided at the June 7, 2021 public hearing is included in Appendix 3.

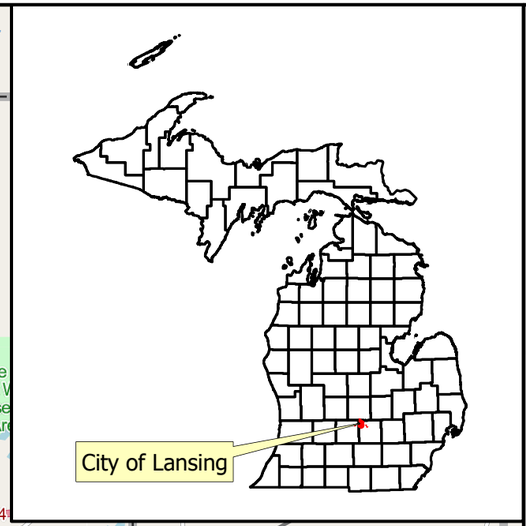
8.4 Comments and Responses

No comments were made at the public hearing.

8.5 Adoption of the Project Plan

The Board of Commissioners met on June 17, 2021. At that meeting, the Board passed a resolution adopting the selected alternative. A copy of the signed resolution is included in Appendix 3.

Figures



fishbeck
Engineers | Architects | Scientists | Constructors

Hard copy is intended to be 11"x17" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

Lansing Board of Water and Light

Ingham County, Michigan

Drinking Water State Revolving Fund (DWSRF) Project Plan

LEGEND

- BWL Service Territory - Retail
- BWL Service Territory - Wholesale

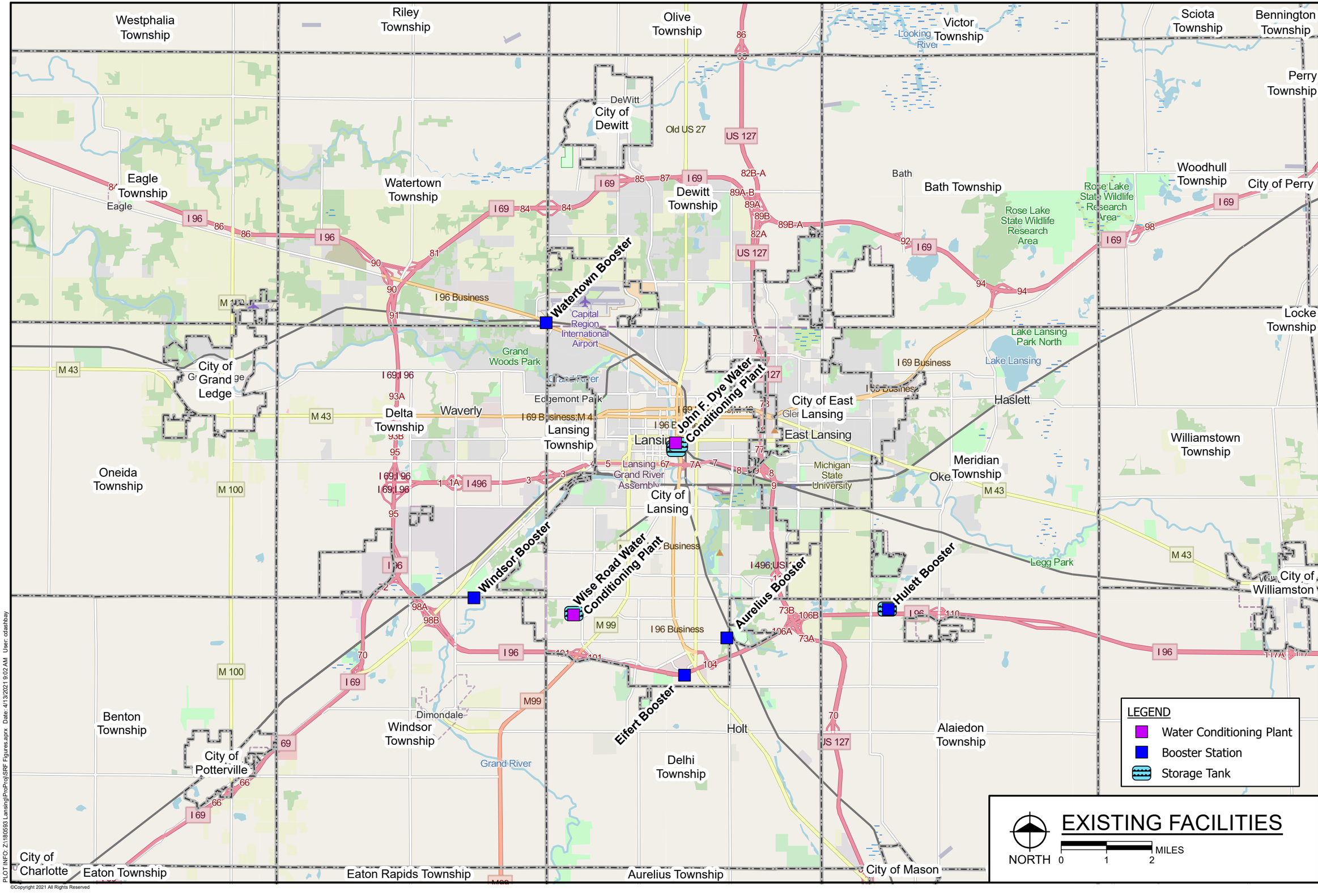
STUDY AREA

NORTH 0 1 2 MILES

PROJECT NO. 180593

FIGURE NO. 1

PLOT INFO: Z:\180593 Lansing\ProPro\SRF Figures.aprx Date: 4/13/2021 9:02 AM User: cdashbay



fishbeck
Engineers | Architects | Scientists | Constructors

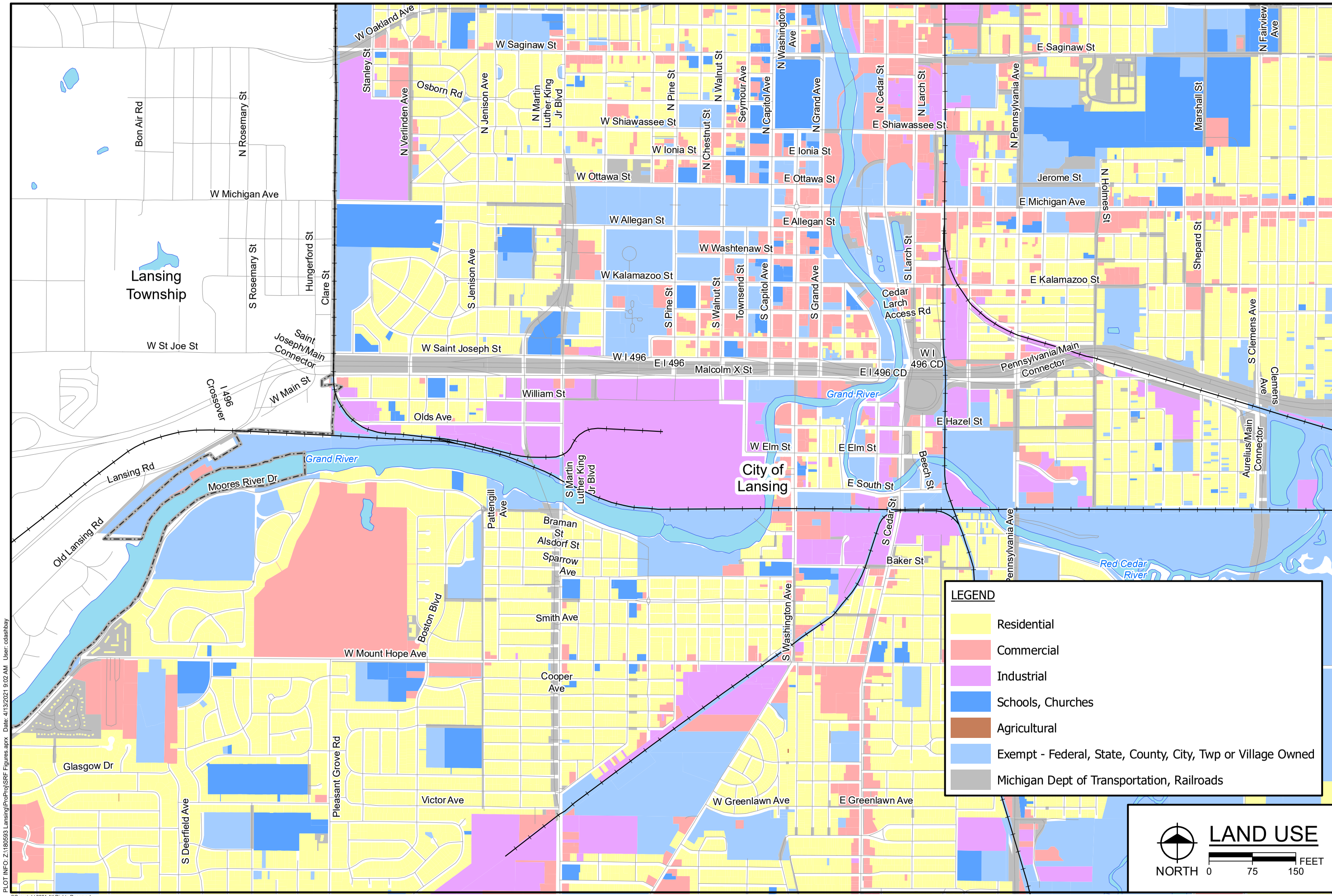
Hard copy is intended to be 11"x17" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

Lansing Board of Water and Light
Ingham County, Michigan
Drinking Water State Revolving Fund (DWSRF) Project Plan

PROJECT NO.
180593

FIGURE NO.
2

PLOT INFO: Z:\180593 Lansing\Proj\SRF Figures.aprx Date: 4/13/2021 9:02 AM User: cdashbay



fishbeck
Engineers | Architects | Scientists | Constructors

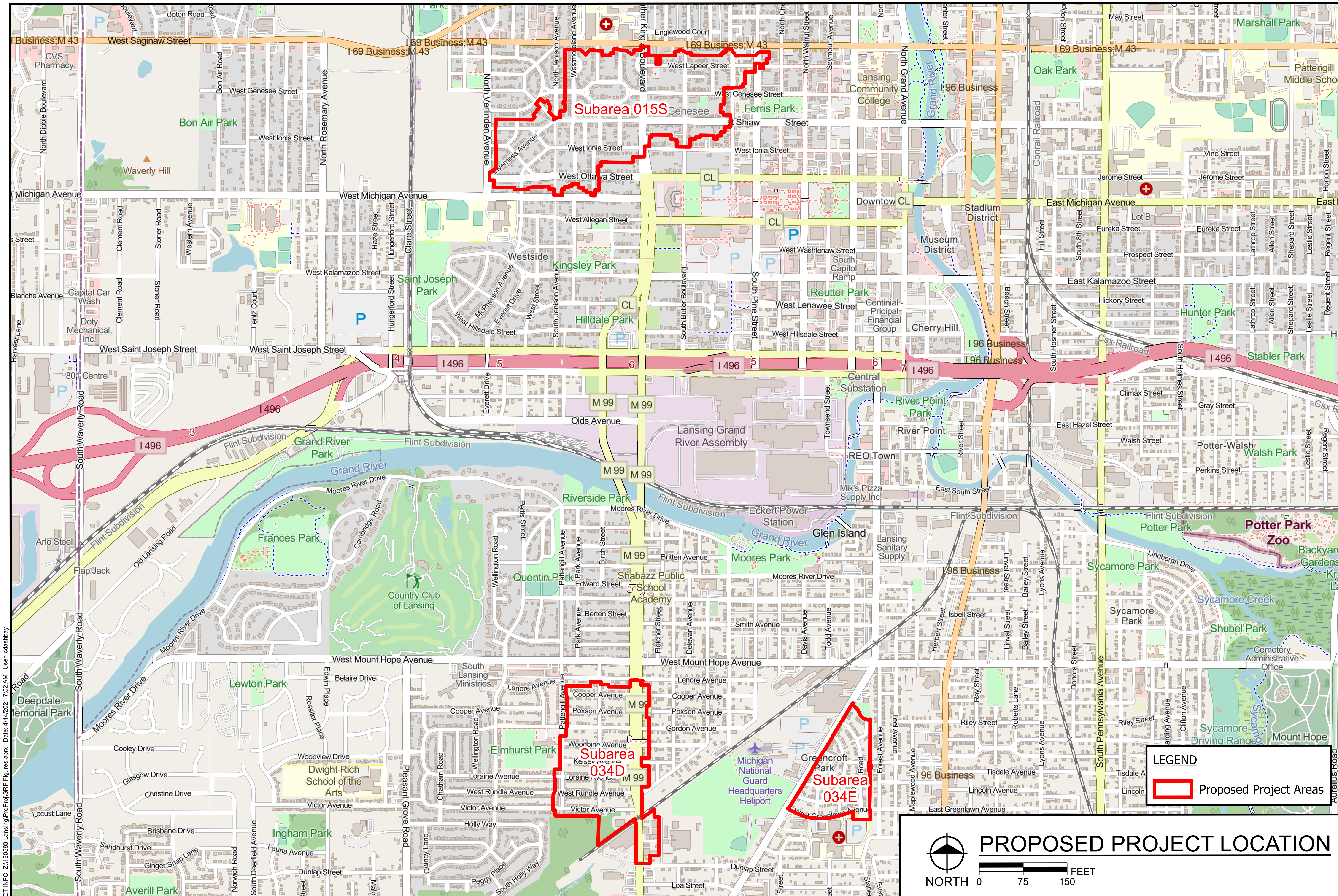
Hard copy is intended to be 11"x17" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

Lansing Board of Water and Light
Ingham County, Michigan
Drinking Water State Revolving Fund (DWSRF) Project Plan

PROJECT NO.
180593

FIGURE NO.
3

PLOT INFO: Z:\180593 Lansing\ProProj\SRF Figures.aprx Date: 4/13/2021 9:02 AM User: cdashbay



PROPOSED PROJECT LOCATION

fishbeck
Engineers | Architects | Scientists | Constructors

Hard copy is intended to be 11"x17" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

Lansing Board of Water and Light

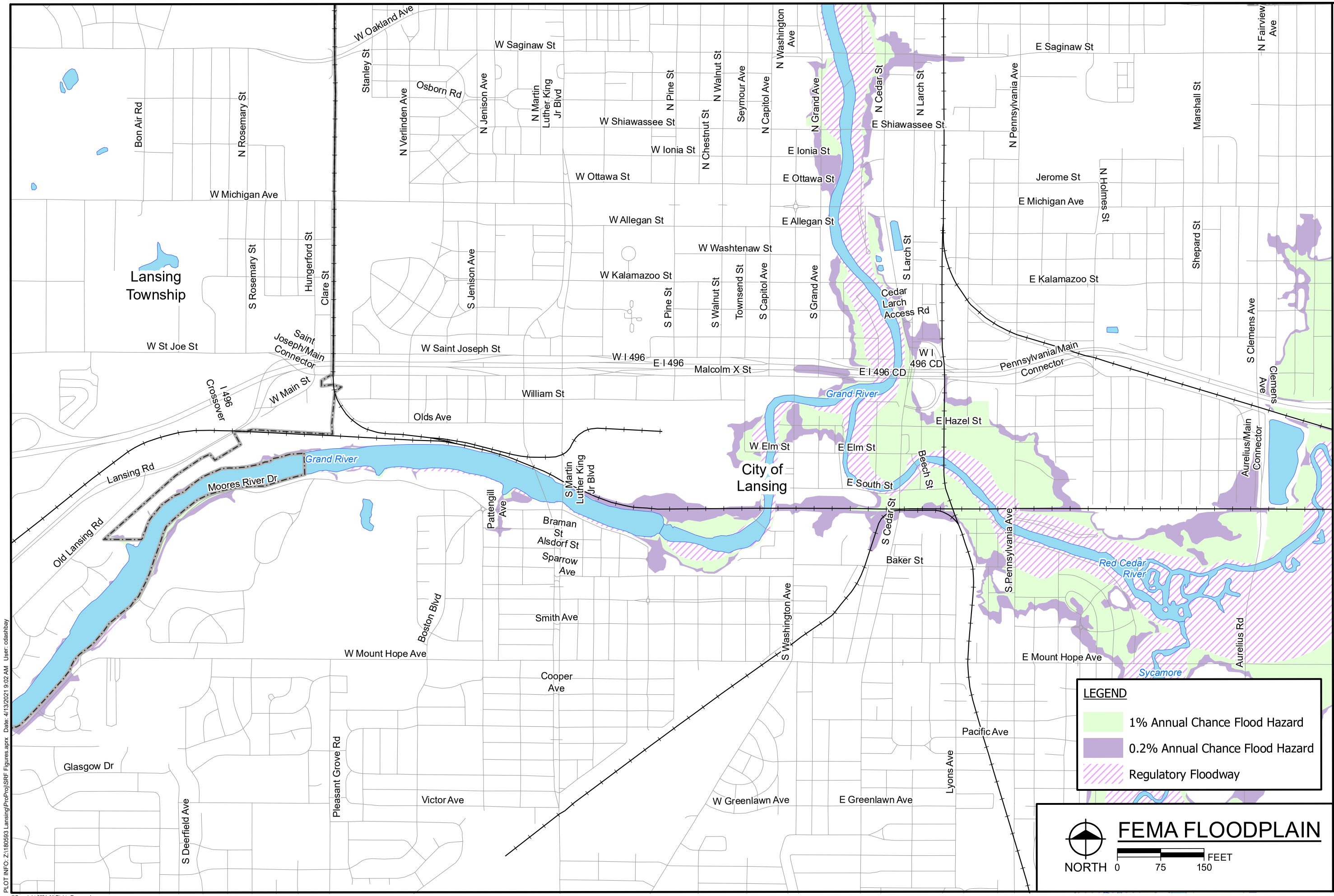
Ingham County, Michigan

Drinking Water State Revolving Fund (DWSRF) Project Plan

PROJECT NO.
180593

FIGURE NO.
4

PLOT INFO: Z:\180593 Lansing\ProPro\SRF Figures.aprx Date: 4/14/2021 7:52 AM User: cdashbay



FEMA FLOODPLAIN

fishbeck
Engineers | Architects | Scientists | Constructors

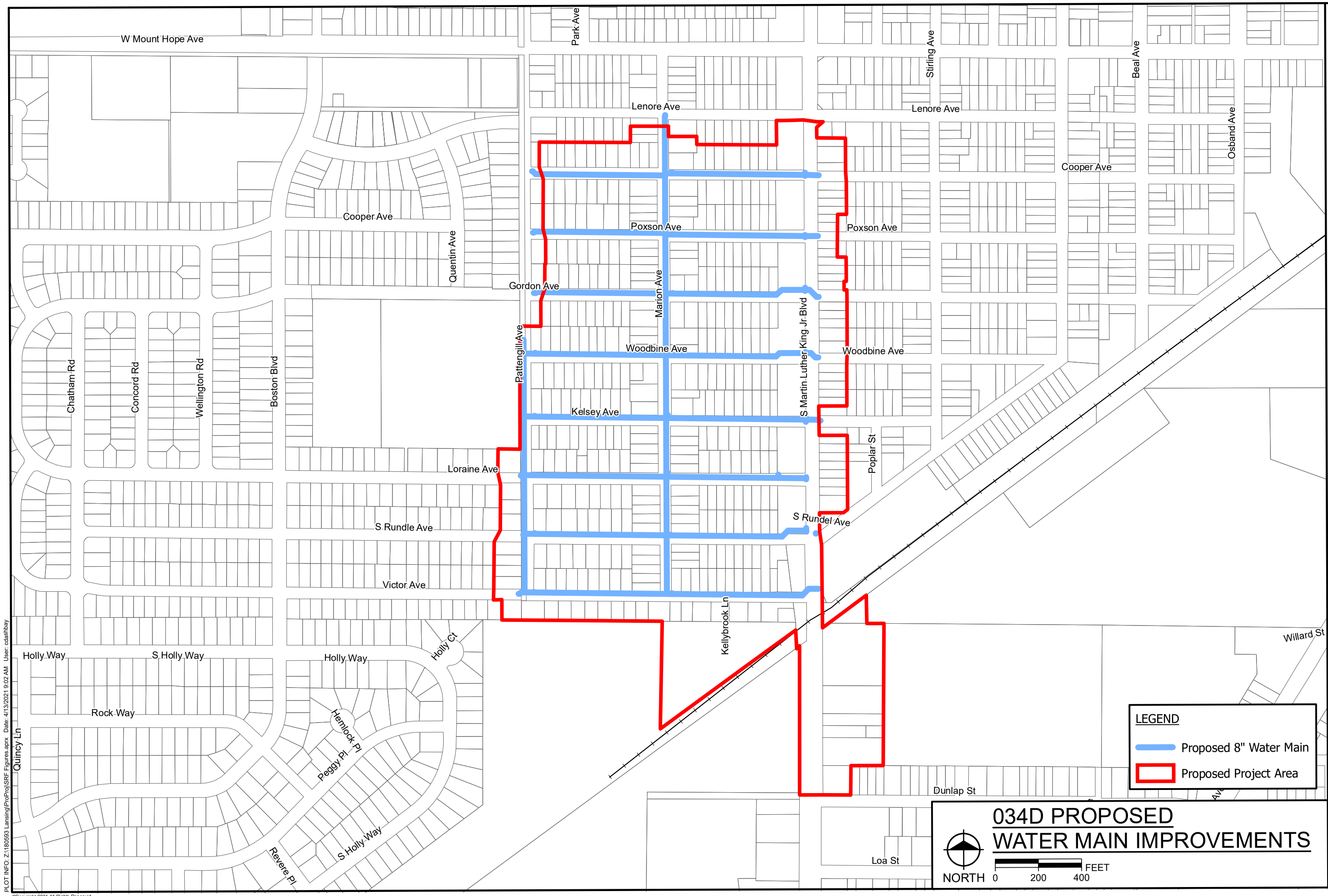
Hard copy is intended to be 11"x17" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

Lansing Board of Water and Light
Ingham County, Michigan
Drinking Water State Revolving Fund (DWSRF) Project Plan

PROJECT NO.
180593

FIGURE NO.
5

PLOT INFO: Z:\180593 Lansing\ProProj\SRF Figures.aprx Date: 4/13/2021 9:02 AM User: cdashbay



fishbeck
Engineers | Architects | Scientists | Constructors

Hard copy is intended to be 11"x17" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

Lansing Board of Water and Light
Ingham County, Michigan
Drinking Water State Revolving Fund (DWSRF) Project Plan

PROJECT NO.
180593

FIGURE NO.
6

PLOT INFO: Z:\180593 LansingProj\SRF Figures.aprx Date: 4/13/2021 9:02 AM User: cdashbay

Lenore Ave
Cooper Ave
Osband Ave
Poxson Ave
Beal Ave
Gordon Ave
S Rundle Ave
S Washington Ave
Greencroft Rd
Kensington Rd
Markley Pl
Wayburn Rd
Wakefield Ave
Strathmore Rd
Eaton Rd
W Rockford Rd
E Rockford Rd
W Greenlawn Ave
E Greenlawn Ave
Willard St
W Willard Ave
Violet Ct
Forest Ave
Teel Ave
Maplewood Ave
Florence St
Woodrow Ave
Colvin Ct
Riley St
Pacific Ave
Edison Ave
Tisdale Ave
S Cedar St
Lincoln Ave
Lincoln Ave
Garfield St

LEGEND

Proposed 8" Water Main

Proposed Project Area

034E PROPOSED
WATER MAIN IMPROVEMENTS

NORTH

0 200 400 FEET

fishbeck
Engineers | Architects | Scientists | Constructors

Hard copy is intended to be 11"x17" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

Lansing Board of Water and Light

Ingham County, Michigan

Drinking Water State Revolving Fund (DWSRF) Project Plan

PROJECT NO.
180593

FIGURE NO.
7

PLOT INFO: Z:\180593 Lansing\ProProj\SRF Figures.aprx Date: 4/13/2021 9:02 AM User: cdashbay

PLOT INFO: Z:\180593 Lansing\ProProj\SRF Figures.aprx Date: 4/14/2021 7:52 AM User: cdashbay

Stanley St
Durant St
Durant St
W Oakland Ave
W Michigan Ave
N Verlinden Ave
N Genesee St
Cleo St
Inverness Ave
Forbes St
S Genesee Dr
Osborn Rd
Drexel Rd
Cawood St
Cawood St
Memphis St
McPherson Ave
Fulton Pl
Comfort St
West St
Spencer St
S Jenison Ave
N Jenison Ave
N Genesee Dr
W Ionia St
Westmoreland Ave
Huron St
Chelsea Ave
Howe St
Dinsmore Dr
Clayton St
Lahoma St
Carey St
Carey St
N Genesee St
W Saginaw St
Riddle Ct
Bartlett St
Bartlett St
Chelsea St
Church Ct
Rose Ct
Kirby Dr
N Genesee Dr
S Martin Luther King Jr Blvd
N Martin Luther King Jr Blvd
S Martin Luther King Jr Blvd
W Lapeer St
W Genesee St
Princeton Ave
Summerville Ave
S Butler Blvd
N Butler Blvd
Chicago Ave
Englewood Ct
Edgewood Ct
Bancroft Ct
W Ionia St
Leitram St
Wisconsin Ave
W Shiawassee St
N Sycamore St
Leonard Ct
W Ottawa St
Inner Ct
N Pine St
N Chestnut St
N Chestnut St
W Madison St

LEGEND

- Proposed 8" Water Main
- Proposed 16" Water Main
- Proposed Project Area

NORTH 0 200 400 FEET

015S PROPOSED WATER MAIN IMPROVEMENTS

Lansing Board of Water and Light

Ingham County, Michigan

Drinking Water State Revolving Fund (DWSRF) Project Plan

PROJECT NO. 180593

FIGURE NO. 8

Hard copy is intended to be 11"x17" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

fishbeck
Engineers | Architects | Scientists | Constructors

PLOT INFO: Z:\180593 Lansing\ProProj\SRF Figures.aprx Date: 4/13/2021 9:02 AM User: cdashbay

Glasgow Dr
Old Lansing Rd
Lansing Rd
Moores River Dr
Grand River
I 496 Crossover
W St Joe St
Lansing Township
Bon Air Rd
W Michigan Ave
N Rosemary St
S Rosemary St
W Main St
Joseph Saint Cloud Main Connector
Hungerford St
Clare St
S Deerfield Ave
Pleasant Grove Rd
W Mount Hope Ave
Boston Blvd
Victor Ave
Olds Ave
W Saint Joseph St
S Jenison Ave
N Jenison Ave
Osborn Rd
Stanley St
W Oakland Ave
N Verlinden Ave
W Saginaw St
N Martin Luther King Jr Blvd
Pattengill Ave
William St
Cooper Ave
Smith Ave
Sparrow Ave
Alsdorf St
Braman St
S Martin Luther King Jr Blvd
R2UBH
W I 496
E I 496
Malcolm X St
W Kalamazoo St
W Allegan St
W Ottawa St
W Shiawassee St
W Ionia St
N Chestnut St
S Pine St
N Pine St
S Walnut St
N Walnut St
W Washtenaw St
Townsend St
Seymour Ave
S Capitol Ave
N Capitol Ave
N Washington Ave
City of Lansing
W Elm St
S Washington Ave
W Greenlawn Ave
E Allegan St
E Ottawa St
E Ionia St
S Grand Ave
N Grand Ave
Grand River
E Elm St
E South St
E I 496 CD
Cedar Larch Access Rd
S Cedar St
Baker St
E Greenlawn Ave
E Shiawassee St
N Cedar St
S Larch St
N Larch St
Beech St
W I 496 CD
E Hazel St
Lyons Ave
Pacific Ave
U.S. Fish and Wildlife Service National Standards
S Pennsylvania Ave
Pennsylvania Main Connector
E Kalamazoo St
E Michigan Ave
Jerome St
N Pennsylvania Ave
E Saginaw St
N Holmes St
E Mount Hope
Red Cedar River
Shepard St
Marshall St
Aurelius/Main Connector
S Clemens Ave
Clemens Ave
N Fairview Ave

LEGEND

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

NORTH

WETLANDS

0 75 150 FEET

Lansing Board of Water and Light

Ingham County, Michigan

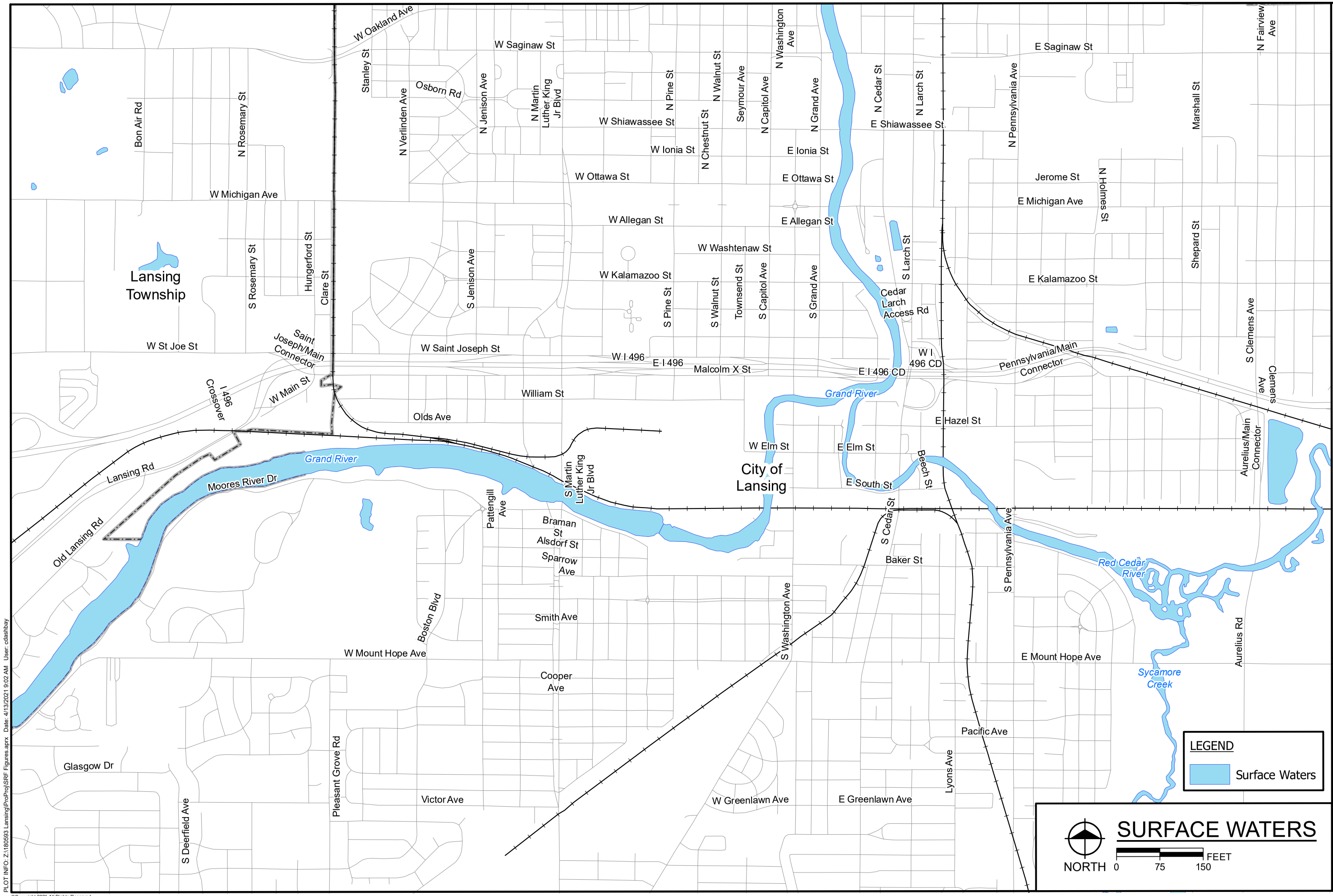
Drinking Water State Revolving Fund (DWSRF) Project Plan

Hard copy is intended to be 11"x17" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

fishbeck
Engineers | Architects | Scientists | Constructors

PROJECT NO. 180593

FIGURE NO. 9



fishbeck
Engineers | Architects | Scientists | Constructors

Hard copy is intended to be 11"x17" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

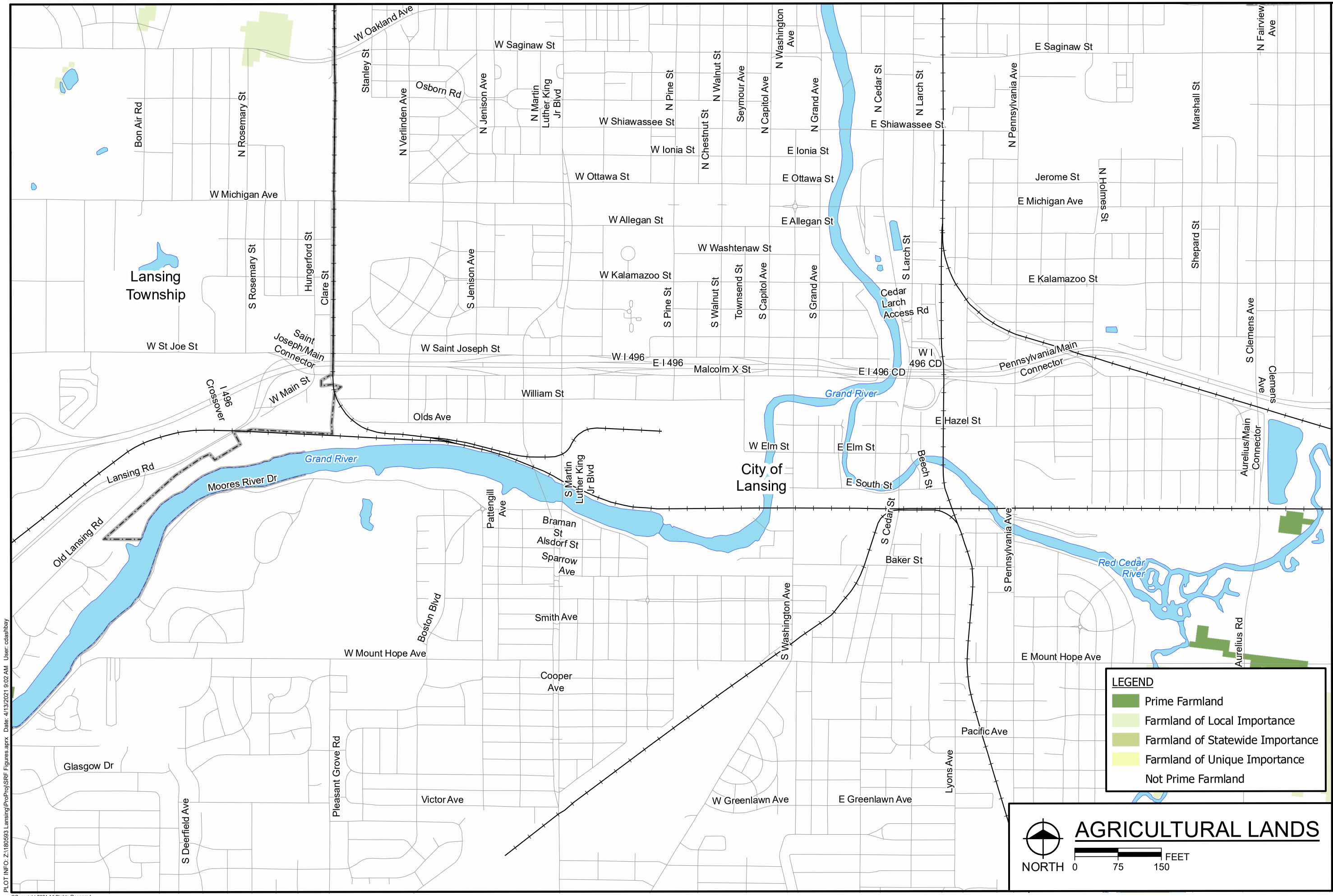
Lansing Board of Water and Light
Ingham County, Michigan

Drinking Water State Revolving Fund (DWSRF) Project Plan

PROJECT NO.
180593

FIGURE NO.
10

PLOT INFO: Z:\180593 Lansing\ProProj\SRF Figures.aprx Date: 4/13/2021 9:02 AM User: cdashbay



AGRICULTURAL LANDS

fishbeck
Engineers | Architects | Scientists | Constructors

Hard copy is intended to be 11"x17" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

Lansing Board of Water and Light
Ingham County, Michigan
Drinking Water State Revolving Fund (DWSRF) Project Plan

PROJECT NO.
180593

FIGURE NO.
11

PLOT INFO: Z:\180593 Lansing\ProProj\SRF Figures.aprx Date: 4/13/2021 9:02 AM User: cdashbay

Appendix 1

Engineer's Opinion of Probable Cost

CSO Subarea 034D
Lansing Board of Water & Light
DWSRF Cost Estimate - Open Cut Option w/ CSO

Date: 3/11/2021
Project No. 180593
Prepared by: CZ

Estimate

Item No.	Item Description	Unit	Est. Quantity	Unit Price ($)	Total Cost ($)
1	Audiovisual Coverage	LS	1	$ 15,000.00	$ 15,000.00
2	Mobilization, Max 3%	LS	1	$ 112,000.00	$ 112,000.00
3	Curb and Gutter, Rem	Ft	1,450	$ 10.00	$ 14,500.00
4	Pavt, Rem	Syd	15,700	$ 10.00	$ 157,000.00
5	Erosion Control	LS	1	$ 20,000.00	$ 20,000.00
6	Subbase, CIP	Cyd	5,230	$ 20.00	$ 104,600.00
7	Aggregate Base, 8 inch	Syd	15,700	$ 12.00	$ 188,400.00
8	HMA, LVSP	Ton	3,735	$ 125.00	$ 466,875.00
9	Curb and Gutter, Conc, Det F4, Modified	Ft	1,450	$ 25.00	$ 36,250.00
10	Pavement Markings	LS	1	$ 10,000.00	$ 10,000.00
11	Traffic Control	LS	1	$ 50,000.00	$ 50,000.00
12	Lawn Restoration	LS	1	$ 20,000.00	$ 20,000.00
13	Water Main, Connect to Existing	Ea	17	$ 750.00	$ 12,750.00
14	Water Main, DI, 4 inch, Tr Det G, Modified	Ft	9	$ 110.00	$ 990.00
15	Water Main, DI, 6 inch, Tr Det G, Modified	Ft	80	$ 120.00	$ 9,600.00
16	Water Main, DI, 8 inch, Tr Det G, Modified	Ft	14,115	$ 120.00	$ 1,693,800.00
17	Water Main, DI, 12 inch, Tr Det G, Modified	Ft	100	$ 130.00	$ 13,000.00
18	Gate Valve and Box, 8 inch, Modified	Ea	41	$ 2,500.00	$ 102,500.00
19	Gate Valve and Box, 12 inch, Modified	Ea	4	$ 3,000.00	$ 12,000.00
20	Hydrant Assembly	Ea	16	$ 5,000.00	$ 80,000.00
21	Water Service	Ea	359	$ 2,000.00	$ 718,000.00
	Estimated Construction Cost				**$ 3,837,265.00**
	35% ELAC				**$ 1,343,042.75**
				Total Construction Cost	**$ 5,200,000.00**

Engineer's Opinion of Probable Cost

CSO Subarea 034D
Lansing Board of Water & Light
DWSRF Cost Estimate - Open Cut Option w/out CSO

Date: 3/11/2021
Project No. 180593
Prepared by: CZ

Estimate

Item No.	Item Description	Unit	Est. Quantity	Unit Price ($)	Total Cost ($)
1	Audiovisual Coverage	LS	1	$ 15,000.00	$ 15,000.00
2	Mobilization, Max 3%	LS	1	$ 137,000.00	$ 137,000.00
3	Curb and Gutter, Rem	Ft	1,450	$ 10.00	$ 14,500.00
4	Pavt, Rem	Syd	15,700	$ 10.00	$ 157,000.00
5	Erosion Control	LS	1	$ 20,000.00	$ 20,000.00
6	Subbase, CIP	Cyd	5,230	$ 20.00	$ 104,600.00
7	Aggregate Base, 8 inch	Syd	15,700	$ 12.00	$ 188,400.00
8	HMA, LVSP	Ton	7,760	$ 125.00	$ 970,000.00
9	Curb and Gutter, Conc, Det F4, Modified	Ft	1,450	$ 25.00	$ 36,250.00
10	Cold Milling HMA Surface	Syd	18,940	$ 2.00	$ 37,880.00
11	Pavement Markings	LS	1	$ 25,000.00	$ 25,000.00
12	Traffic Control	LS	1	$ 75,000.00	$ 75,000.00
13	Lawn Restoration	LS	1	$ 20,000.00	$ 20,000.00
14	Water Main, Connect to Existing	Ea	17	$ 750.00	$ 12,750.00
15	Water Main, DI, 4 inch, Tr Det G, Modified	Ft	9	$ 110.00	$ 990.00
16	Water Main, DI, 6 inch, Tr Det G, Modified	Ft	80	$ 125.00	$ 10,000.00
17	Water Main, DI, 8 inch, Tr Det G, Modified	Ft	14,115	$ 125.00	$ 1,764,375.00
18	Water Main, DI, 12 inch, Tr Det G, Modified	Ft	100	$ 150.00	$ 15,000.00
19	Gate Valve and Box, 8 inch, Modified	Ea	41	$ 2,500.00	$ 102,500.00
20	Gate Valve and Box, 12 inch, Modified	Ea	4	$ 3,000.00	$ 12,000.00
21	Hydrant Assembly	Ea	16	$ 5,000.00	$ 80,000.00
22	Water Service	Ea	359	$ 2,500.00	$ 897,500.00
	Estimated Construction Cost				**$ 4,695,745.00**
	35% ELAC				**$ 1,643,510.75**
				Total Construction Cost	**$ 6,400,000.00**

Engineer's Opinion of Probable Cost

CSO Subarea 034D — **Date: 3/11/2021**

Lansing Board of Water & Light — **Project No. 180593**

DWSRF Cost Estimate - Directional Drill Option — **Prepared by: CZ**

Estimate

Item No.	Item Description	Unit	Est. Quantity	Unit Price ($)	Total Cost ($)
1	Audiovisual Coverage	LS	1	$ 15,000.00	$ 15,000.00
2	Mobilization, Max 3%	LS	1	$ 168,000.00	$ 168,000.00
3	Curb and Gutter, Rem	Ft	1,450	$ 10.00	$ 14,500.00
4	Pavt, Rem	Syd	420	$ 10.00	$ 4,200.00
5	Erosion Control	LS	1	$ 20,000.00	$ 20,000.00
6	Subbase, CIP	Cyd	20	$ 20.00	$ 400.00
7	Aggregate Base, 8 inch	Syd	420	$ 12.00	$ 5,040.00
8	HMA, LVSP	Ton	135	$ 125.00	$ 16,875.00
9	Curb and Gutter, Conc, Det F4, Modified	Ft	1,450	$ 25.00	$ 36,250.00
10	Pavement Markings	LS	1	$ 10,000.00	$ 10,000.00
11	Traffic Control	LS	1	$ 50,000.00	$ 50,000.00
12	Lawn Restoration	LS	1	$ 20,000.00	$ 20,000.00
13	Water Main, Connect to Existing	Ea	17	$ 750.00	$ 12,750.00
14	Water Main, DI, 4 inch, Tr Det G, Modified	Ft	9	$ 150.00	$ 1,350.00
15	Water Main, DI, 6 inch, Tr Det G, Modified	Ft	80	$ 200.00	$ 16,000.00
16	Water Main, DI, 8 inch, Tr Det G, Modified	Ft	14,115	$ 300.00	$ 4,234,500.00
17	Water Main, DI, 12 inch, Tr Det G, Modified	Ft	100	$ 500.00	$ 50,000.00
18	Gate Valve and Box, 8 inch, Modified	Ea	41	$ 2,500.00	$ 102,500.00
19	Gate Valve and Box, 12 inch, Modified	Ea	4	$ 3,000.00	$ 12,000.00
20	Hydrant Assembly	Ea	16	$ 5,000.00	$ 80,000.00
21	Water Service	Ea	359	$ 2,500.00	$ 897,500.00
	Estimated Construction Cost				**$ 5,766,865.00**
	35% ELAC				**$ 2,018,402.75**
				Total Construction Cost	**$ 7,800,000.00**

Engineer's Opinion of Probable Cost

CSO Subarea 034E
Lansing Board of Water & Light
DWSRF Cost Estimate - Open Cut Option w/ CSO

Date: 3/11/2021
Project No. 180593
Prepared by: CZ

Estimate

Item No.	Item Description	Unit	Est. Quantity	Unit Price ($)	Total Cost ($)
1	Audiovisual Coverage	LS	1	$ 10,000.00	$ 10,000.00
2	Mobilization, Max 3%	LS	1	$ 60,000.00	$ 60,000.00
3	Curb and Gutter, Rem	Ft	820	$ 10.00	$ 8,200.00
4	Pavt, Rem	Syd	7,840	$ 10.00	$ 78,400.00
5	Erosion Control	LS	1	$ 15,000.00	$ 15,000.00
6	Subbase, CIP	Cyd	2,620	$ 20.00	$ 52,400.00
7	Aggregate Base, 8 inch	Syd	7,840	$ 12.00	$ 94,080.00
8	HMA, LVSP	Ton	1,785	$ 125.00	$ 223,125.00
9	Curb and Gutter, Conc, Det F4, Modified	Ft	820	$ 25.00	$ 20,500.00
10	Pavement Markings	LS	1	$ 5,000.00	$ 5,000.00
11	Traffic Control	LS	1	$ 20,000.00	$ 20,000.00
12	Lawn Restoration	LS	1	$ 15,000.00	$ 15,000.00
13	Water Main, Connect to Existing	Ea	11	$ 750.00	$ 8,250.00
14	Water Main, DI, 8 inch, Tr Det G, Modified	Ft	7,050	$ 120.00	$ 846,000.00
15	Gate Valve and Box, 8 inch, Modified	Ea	20	$ 2,500.00	$ 50,000.00
16	Hydrant Assembly	Ea	8	$ 5,000.00	$ 40,000.00
17	Water Service	Ea	203	$ 2,000.00	$ 406,000.00
	Estimated Construction Cost				**$ 1,951,955.00**
	35% ELAC				**$ 683,184.25**
				Total Construction Cost	**$ 2,700,000.00**

Engineer's Opinion of Probable Cost

CSO Subarea 034E — **Date: 3/11/2021**
Lansing Board of Water & Light — **Project No. 180593**
DWSRF Cost Estimate - Open Cut Option w/out CSO — **Prepared by: CZ**

Estimate

Item No.	Item Description	Unit	Est. Quantity	Unit Price ($)	Total Cost ($)
1	Audiovisual Coverage	LS	1	$ 10,000.00	$ 10,000.00
2	Mobilization, Max 3%	LS	1	$ 75,000.00	$ 75,000.00
3	Curb and Gutter, Rem	Ft	820	$ 10.00	$ 8,200.00
4	Pavt, Rem	Syd	7,840	$ 10.00	$ 78,400.00
5	Erosion Control	LS	1	$ 15,000.00	$ 15,000.00
6	Subbase, CIP	Cyd	2,620	$ 20.00	$ 52,400.00
7	Aggregate Base, 8 inch	Syd	7,840	$ 12.00	$ 94,080.00
8	HMA, LVSP	Ton	4,365	$ 125.00	$ 545,625.00
9	Cold Milling HMA Surface	Syd	10,835	$ 2.00	$ 21,670.00
10	Curb and Gutter, Conc, Det F4, Modified	Ft	820	$ 25.00	$ 20,500.00
11	Pavement Markings	LS	1	$ 10,000.00	$ 10,000.00
12	Traffic Control	LS	1	$ 40,000.00	$ 40,000.00
13	Lawn Restoration	LS	1	$ 15,000.00	$ 15,000.00
14	Water Main, Connect to Existing	Ea	11	$ 750.00	$ 8,250.00
15	Water Main, DI, 8 inch, Tr Det G, Modified	Ft	7,050	$ 125.00	$ 881,250.00
16	Gate Valve and Box, 8 inch, Modified	Ea	20	$ 2,500.00	$ 50,000.00
17	Hydrant Assembly	Ea	8	$ 5,000.00	$ 40,000.00
18	Water Service	Ea	203	$ 2,500.00	$ 507,500.00
	Estimated Construction Cost				**$ 2,472,875.00**
	35% ELAC				**$ 865,506.25**
				Total Construction Cost	**$ 3,400,000.00**

Engineer's Opinion of Probable Cost

CSO Subarea 034E — **Date: 3/11/2021**

Lansing Board of Water & Light — **Project No. 180593**

DWSRF Cost Estimate - Directional Drill Option — **Prepared by: CZ**

Estimate

Item No.	Item Description	Unit	Est. Quantity	Unit Price ($)	Total Cost ($)
1	Audiovisual Coverage	LS	1	$ 10,000.00	$ 10,000.00
2	Mobilization, Max 3%	LS	1	$ 85,000.00	$ 85,000.00
3	Curb and Gutter, Rem	Ft	820	$ 10.00	$ 8,200.00
4	Pavt, Rem	Syd	370	$ 10.00	$ 3,700.00
5	Erosion Control	LS	1	$ 15,000.00	$ 15,000.00
6	Subbase, CIP	Cyd	20	$ 20.00	$ 400.00
7	Aggregate Base, 8 inch	Syd	370	$ 12.00	$ 4,440.00
8	HMA, LVSP	Ton	75	$ 125.00	$ 9,375.00
9	Curb and Gutter, Conc, Det F4, Modified	Ft	820	$ 25.00	$ 20,500.00
10	Pavement Markings	LS	1	$ 5,000.00	$ 5,000.00
11	Traffic Control	LS	1	$ 20,000.00	$ 20,000.00
12	Lawn Restoration	LS	1	$ 15,000.00	$ 15,000.00
13	Water Main, Connect to Existing	Ea	11	$ 750.00	$ 8,250.00
14	Water Main, DI, 8 inch, Tr Det G, Modified	Ft	7,050	$ 300.00	$ 2,115,000.00
15	Gate Valve and Box, 8 inch, Modified	Ea	20	$ 2,500.00	$ 50,000.00
16	Hydrant Assembly	Ea	8	$ 5,000.00	$ 40,000.00
17	Water Service	Ea	203	$ 2,500.00	$ 507,500.00
	Estimated Construction Cost				**$ 2,917,365.00**
	35% ELAC				**$ 1,021,077.75**
				Total Construction Cost	**$ 4,000,000.00**

Engineer's Opinion of Probable Cost

CSO Subarea 015S — **Date: 3/11/2021**
Lansing Board of Water & Light — **Project No. 180593**
DWSRF Cost Estimate - Open Cut Option w/ CSO — **Prepared by: CZ**

Estimate

Item No.	Item Description	Unit	Est. Quantity	Unit Price ($)	Total Cost ($)
1	Audiovisual Coverage	LS	1	$ 25,000.00	$ 25,000.00
2	Mobilization, Max 3%	LS	1	$ 245,000.00	$ 245,000.00
3	Curb and Gutter, Rem	Ft	2,850	$ 10.00	$ 28,500.00
4	Pavt, Rem	Syd	33,000	$ 10.00	$ 330,000.00
5	Erosion Control	LS	1	$ 60,000.00	$ 60,000.00
6	Subbase, CIP	Cyd	11,000	$ 20.00	$ 220,000.00
7	Aggregate Base, 8 inch	Syd	33,000	$ 12.00	$ 396,000.00
8	HMA, LVSP	Ton	8,270	$ 125.00	$ 1,033,750.00
9	Curb and Gutter, Conc, Det F4, Modified	Ft	2,850	$ 25.00	$ 71,250.00
10	Pavement Markings	LS	1	$ 20,000.00	$ 20,000.00
11	Traffic Control	LS	1	$ 100,000.00	$ 100,000.00
12	Lawn Restoration	LS	1	$ 80,000.00	$ 80,000.00
13	Water Main, Connect to Existing	Ea	23	$ 750.00	$ 17,250.00
14	Water Main, DI, 8 inch, Tr Det G, Modified	Ft	29,690	$ 120.00	$ 3,562,800.00
15	Water Main, DI, 16 inch, Tr Det G, Modified	Ft	1,670	$ 150.00	$ 250,500.00
16	Gate Valve and Box, 8 inch, Modified	Ea	105	$ 2,500.00	$ 262,500.00
17	Gate Valve and Box, 16 inch, Modified	Ea	5	$ 4,000.00	$ 20,000.00
18	Hydrant Assembly	Ea	35	$ 5,000.00	$ 175,000.00
19	Water Service	Ea	712	$ 2,000.00	$ 1,424,000.00
	Estimated Construction Cost				**$ 8,321,550.00**
	35% ELAC				**$ 2,912,542.50**
				Total Construction Cost	**$ 11,300,000.00**

Engineer's Opinion of Probable Cost

CSO Subarea 015S — **Date: 3/11/2021**
Lansing Board of Water & Light — **Project No. 180593**
DWSRF Cost Estimate - Open Cut Option w/out CSO — **Prepared by: CZ**

Estimate

Item No.	Item Description	Unit	Est. Quantity	Unit Price ($)	Total Cost ($)
1	Audiovisual Coverage	LS	1	$ 25,000.00	$ 25,000.00
2	Mobilization, Max 3%	LS	1	$ 325,000.00	$ 325,000.00
3	Curb and Gutter, Rem	Ft	2,850	$ 10.00	$ 28,500.00
4	Pavt, Rem	Syd	33,000	$ 10.00	$ 330,000.00
5	Erosion Control	LS	1	$ 60,000.00	$ 60,000.00
6	Subbase, CIP	Cyd	11,000	$ 20.00	$ 220,000.00
7	Aggregate Base, 8 inch	Syd	33,000	$ 12.00	$ 396,000.00
8	HMA, LVSP	Ton	24,065	$ 125.00	$ 3,008,125.00
9	Cold Milling HMA Surface	Syd	58,220	$ 2.00	$ 116,440.00
10	Curb and Gutter, Conc, Det F4, Modified	Ft	2,850	$ 25.00	$ 71,250.00
11	Pavement Markings	LS	1	$ 20,000.00	$ 20,000.00
12	Traffic Control	LS	1	$ 150,000.00	$ 150,000.00
13	Lawn Restoration	LS	1	$ 80,000.00	$ 80,000.00
14	Water Main, Connect to Existing	Ea	23	$ 750.00	$ 17,250.00
15	Water Main, DI, 8 inch, Tr Det G, Modified	Ft	29,690	$ 125.00	$ 3,711,250.00
16	Water Main, DI, 16 inch, Tr Det G, Modified	Ft	1,670	$ 200.00	$ 334,000.00
17	Gate Valve and Box, 8 inch, Modified	Ea	105	$ 2,500.00	$ 262,500.00
18	Gate Valve and Box, 16 inch, Modified	Ea	5	$ 4,000.00	$ 20,000.00
19	Hydrant Assembly	Ea	35	$ 5,000.00	$ 175,000.00
20	Water Service	Ea	712	$ 2,500.00	$ 1,780,000.00
	Estimated Construction Cost				**$ 11,130,315.00**
	35% ELAC				**$ 3,895,610.25**
				Total Construction Cost	**$ 15,100,000.00**

Engineer's Opinion of Probable Cost

CSO Subarea 015S — **Date: 3/11/2021**

Lansing Board of Water & Light — **Project No. 180593**

DWSRF Cost Estimate - Directional Drill Option — **Prepared by: CZ**

Estimate

Item No.	Item Description	Unit	Est. Quantity	Unit Price ($)	Total Cost ($)
1	Audiovisual Coverage	LS	1	$ 25,000.00	$ 25,000.00
2	Mobilization, Max 3%	LS	1	$ 380,000.00	$ 380,000.00
3	Curb and Gutter, Rem	Ft	2,850	$ 10.00	$ 28,500.00
4	Pavt, Rem	Syd	1,235	$ 10.00	$ 12,350.00
5	Erosion Control	LS	1	$ 60,000.00	$ 60,000.00
6	Subbase, CIP	Cyd	50	$ 20.00	$ 1,000.00
7	Aggregate Base, 8 inch	Syd	1,235	$ 12.00	$ 14,820.00
8	HMA, LVSP	Ton	330	$ 125.00	$ 41,250.00
9	Curb and Gutter, Conc, Det F4, Modified	Ft	2,850	$ 25.00	$ 71,250.00
10	Pavement Markings	LS	1	$ 20,000.00	$ 20,000.00
11	Traffic Control	LS	1	$ 100,000.00	$ 100,000.00
12	Lawn Restoration	LS	1	$ 80,000.00	$ 80,000.00
13	Water Main, Connect to Existing	Ea	23	$ 750.00	$ 17,250.00
14	Water Main, DI, 8 inch, Tr Det G, Modified	Ft	29,690	$ 300.00	$ 8,907,000.00
15	Water Main, DI, 16 inch, Tr Det G, Modified	Ft	1,670	$ 600.00	$ 1,002,000.00
16	Gate Valve and Box, 8 inch, Modified	Ea	105	$ 2,500.00	$ 262,500.00
17	Gate Valve and Box, 16 inch, Modified	Ea	5	$ 4,000.00	$ 20,000.00
18	Hydrant Assembly	Ea	35	$ 5,000.00	$ 175,000.00
19	Water Service	Ea	712	$ 2,500.00	$ 1,780,000.00
	Estimated Construction Cost				**$ 12,997,920.00**
	35% ELAC				**$ 4,549,272.00**
				Total Construction Cost	**$ 17,600,000.00**

Appendix 2

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE

LEVEL 1 ASSESSMENT FORM FOR COMMUNITY WATER SUPPLIES

Issued under authority of the Safe Drinking Water Act, 1976 PA 399, as amended, MCL 325.1001 et seq., and its Administrative Rules (Act 399).

This form must be completed and submitted to the appropriate DEQ District Office as soon as possible, but no later than 30 days after the supply triggered the assessment. It should be completed by the Operator In Charge, Water Supply Owner, or a knowledgeable representative of the water system.

1. General Information

CWS Name: Lansing Board of Water & Light (BWL)	WSSN: 3760
Assessor Name: Angie Goodman	Assessor Title: Water Quality Administrator
Phone Number: 517-702-7059	E-mail: angie.goodman@lbwl.com
Trigger Event: Greater Than 5% Total Coliform Positives ☐ *or* Failure to Collect All Repeat Samples ☐	
Date Assessment Triggered: see Delta Township L1 Assessment	Date Assessment Completed: see notes below in #4

2. Bacteriological Sample Summary (Include all results associated with monitoring period, add additional pages if necessary)

Date & Time	Location	Purpose (Routine, Repeat, Triggered, Construction, Repair)	Result (ND, TC+, EC+, invalid, interference)	Collected By	Laboratory

3. Assessment Questions: Answer each question in Subsections A - G either Yes, No or Not Applicable (NA). Review and evaluate each question for potential causes of contamination. If the answer to any of these questions is unknown, leave blank and indicate on a separate sheet what actions will be taken to determine the necessary information.

A. Sample Site Selection and Sample Collection	**Answer**		
	Yes	**No**	**NA**
Were the samples collected in accordance with the Sample Site Plan?	☐	☐	☐
Was the location and condition of the sample tap sanitary?	☐	☐	☐
Were proper sample collection procedures followed?	☐	☐	☐
Were the samples submitted to the lab in a timely & acceptable manner?	☐	☐	☐

B. Source – Wells (if wells are not used check here ☐ and go to subsection C)	**Answer**		
	Yes	**No**	**NA**
Do the wells have a proper well cap, sanitary seal and vent screens?	☐	☐	☒
Have the wells/pumps undergone any recent repairs or maintenance activities?	☐	☐	☒
Is the exposed portion of the casing (including electrical conduit) in good condition?	☐	☐	☒
Is the area near the well cap/casing free of insects, bugs, brush and vegetation?	☐	☐	☒
Is there standing water or other unsanitary conditions near the wells?	☐	☐	☒
Any signs of vandalism to wells or forced entry into well houses?	☐	☐	☒

C. Source – Surface Water (if surface water is not used check here ☐ and go to subsection D)	Answer		
	Yes	No	NA
Are there any new potential contamination sources, or visible signs of unsanitary conditions near the raw water intake?	☐	☐	☐
Any signs of vandalism or unauthorized access to source facilities?	☐	☐	☐
Was there any heavy precipitation, rapid snowmelt or flooding recently?	☐	☐	☐
Any unusual changes to quality of the raw water like a spike in turbidity, sudden change in pH or very high heterotrophic plate counts?	☐	☐	☐

D. Treatment (if no treatment check here ☐ and go to subsection E)	Answer		
	Yes	No	NA
Have there been additions or modifications to any treatment process?	☐	☒	☐
Have there been interruptions in any treatment process?	☐	☒	☐
Any signs of vandalism or unauthorized access to treatment equipment or facilities?	☐	☒	☐
Are there any issues with operation or maintenance of treatment equipment, units or processes?	☐	☒	☐
Is there any water quality data that indicates treatment is ineffective?	☐	☒	☐

E. Storage (if no water storage tank check here ☐ and go to subsection F)	Answer		
	Yes	No	NA
Are there any holes, leaks or other structural problems?	☐	☐	☐
Are access hatches and manhole openings tightly covered and secured?	☐	☐	☐
Are all vents and overflow pipes screened?	☐	☐	☐
For hydropneumatic tanks, is the tank waterlogged?	☐	☐	☐
Any signs of vandalism or unauthorized access to storage facilities?	☐	☐	☐
Have the tank(s) been recently drained, cleaned or inspected?	☐	☐	☐

F. Distribution System	Answer		
	Yes	No	NA
Have there been any low pressure events (≤ 20 psi)?	☐	☐	☐
Have there been any water main breaks, repairs, or new main installations?	☐	☐	☐
Have there been any recent fires or hydrant flushing?	☐	☐	☐
Have there been any booster pump issues, repairs or new installations?	☐	☐	☐
Is the supply actively performing cross connection control inspections, including frequent testing of all testable backflow preventers?	☐	☐	☐
Have there been other construction activities like hydrant or valve replacement that could have introduced contamination into the system?	☐	☐	☐
If samples were collected from inside a building, has there been any recent plumbing work performed within the building?	☐	☐	☐

G. Operation and Maintenance (O & M)	Answer		
	Yes	No	NA
Any changes in procedures or staff effecting O & M activities?	☐	☐	☐
Any water quality data collected from the treated water tap or distribution system show results are indicative of an issue?	☐	☐	☐
Any complaints from customers related to water quality or low pressure?	☐	☐	☐
Any other issues or items that may have caused bacteriological contamination?	☐	☐	☐

4. **Issue Description:** For any answer in Part 2, Subsections A - G that are in a shaded box, use this space to describe the event and provide additional information on potential causes of contamination identified during the assessment. Include corresponding dates with your findings. Attach additional page(s) if needed. Include date(s) of low pressure events, water main breaks, maintenance activities, etc. with your findings.
The BWL is completing this form on behalf of our consecutive system Delta Charter Township, as the BWL is the Wholesale Water Provider. The BWL has MDEQ approval to confirm the raw water at representative source locations was negative for E.coli during the 72 hours prior to the time the consecutive system's distribution sample was total coliform positive. Delta Charter Township receives water from Dye WCP and the results for the two raw water representative source locations were negative for E.coli during the 72 hours prior to 06/18/18 and 06/25/18. The BWL did have three samples from the raw water representative source location that were total coliform positive near or on the dates of Delta Charter Township's total coliform positive routine samples. The BWL had Dye S Raw (DSR) total coliform positive, E.coli negative on 06/15/18, 06/18/18 and 06/25/18. The raw water is collected at the entry point to the water conditioning plant, conditioned and then tested again at the Plant Tap (entry point to the distribution system). All Plant Tap samples were negative for total coliform near and on 06/18/18 and 06/25/18. To further investigate the cause of the total coliform positives, E.coli negative at DSR, the BWL did sample a few wells to see if they tested total coliform positive and they did not. Other than the three DSR total coliform positive samples, on 06/15/18, 06/18/18 and 06/25/18, all other raw samples have been negative for total coliform.

5. **Corrective Actions Taken or to be Taken for any Issues Identified in Part 3:** Use this space to describe corrective actions already taken and date(s) completed; or a proposed timetable for corrective actions not yet completed. Attach additional page(s) if needed.

6. **Certification:** I hereby certify that the information contained herein is true, accurate and complete to the best of my knowledge and information.	
Assessor's Name (printed): Angie Goodman	
Assessor's Signature: Angie Goodman	**Date:** 07/10/18

DEQ USE ONLY: This section is to be completed by DEQ.	
Reviewer Name:	**Date Reviewed:**
Date Received:	**Within 30 days of trigger:** Yes ☐ No ☐
Assessment Complete: Yes ☐ No ☐	**Likely Reason for Positive Samples Identified:** Yes ☐ No ☐
Corrective Actions Completed: Yes ☐ No ☐ NA ☐	**Proposed Schedule Acceptable:** Yes ☐ No ☐ NA ☐
Assessment Level Reset Yes ☐ No ☐	
Comments:	

Appendix 3

NOTICE OF PROJECT PLAN PUBLIC HEARING

The Lansing Board of Water & Light will hold a public hearing for the purpose of receiving public comments and input regarding the proposed Drinking Water State Revolving Fund (DWSRF) Project Plan for water main replacement in partnership with the City of Lansing Wet Weather Control Program. The public hearing will be held at 3 P.M., June 7, 2021, via Webex.

Meeting URL	https://lbwlevents.webex.com/lbwlevents/onstage/g.php?MTID=efbffd79742179fe7bd45b658d388d724
Event Number	132 012 7622
Event password	2arK35pYJig
Audio Conferenced:	United States Toll +1-408-418-9388 Access code: 132 012 7622

The purpose of the Project Plan is to secure approval of DWSRF funding for the replacement of aging water main, valves, associated fire hydrants and appurtenance located within the City of Lansing's Combined Sewer Separation Areas of 034D, 034E and 015S to improve water quality and reliability and to improve flow efficiency and public health protection.

The estimated cost for the three proposed projects is $19.2 Million. The estimated cost to a typical residential user for the associated DWSRF loans is $0.35 per month. Any grants awarded to the BWL from the DWSRF program would reduce the estimated cost.

On or before May 5, 2021, copies of the draft Project Plan will be available for public review on the Lansing Board of Water & Light's website at: www.lbwl.com/customers/services/water. All interested parties are invited to present comments on the proposed Project Plan. Written comments may be submitted to the Lansing Board of Water & Light, Attn. Mike Lehtonen, 730 East Hazel Street, Lansing, MI 48901, or via e-mail to: Michael.Lehtonen@LBWL.COM. Written comments must be received no later than June 7, 2021, in order for them to be considered as part of the public record.

NOTICE OF PROJECT PLAN PUBLIC HEARING

The Lansing Board of Water & Light will hold a public hearing for the purpose of receiving public comments and input regarding the proposed Drinking Water State Revolving Fund (DWSRF) Project Plan for water main replacement in partnership with the City of Lansing Wet Weather Control Program. The public hearing will be held at 3 P.M., June 7, 2021, via Webex.

Meeting URL	https://lbwlevents.webex.com/lbwlevents/onstage/g.php?MTID=efbffd79742179fe7bd45b658d388d724
Event Number	132 012 7622
Event password	2arK35pYJig
Audio Conferenced:	United States Toll +1-408-418-9388
Access code:	132 012 7622

The purpose of the Project Plan is to secure approval of DWSRF funding for the replacement of aging water main, valves, associated fire hydrants and appurtenance located within the City of Lansing's Combined Sewer Separation Areas of 034D, 034E and 015S to improve water quality and reliability and to improve flow efficiency and public health protection.

The estimated cost for the three proposed projects is $19.2 Million. The estimated cost to a typical residential user for the associated DWSRF loans is $0.35 per month. Any grants awarded to the BWL from the DWSRF program would reduce the estimated cost.

On or before May 5, 2021, copies of the draft Project Plan will be available for public review on the Lansing Board of Water & Light's website at: www.lbwl.com/customers/services/water. All interested parties are invited to present comments on the proposed Project Plan. Written comments may be submitted to the Lansing Board of Water & Light, Attn. Mike Lehtonen, 730 East Hazel Street, Lansing, MI 48901, or via e-mail to: Michael.Lehtonen@LBWL.COM. Written comments must be received no later than June 7, 2021, in order for them to be considered as part of the public record.

CP#21-103

www.lansingmi.gov/Clerk
www.facebook.com/LansingClerkSwope

CP#21-113

NOTICE OF PROJECT PLAN PUBLIC HEARING

The Lansing Board of Water & Light will hold a public hearing for the purpose of receiving public comments and input regarding the proposed Drinking Water State Revolving Fund (DWSRF) Project Plan for water main replacement in partnership with the City of Lansing Wet Weather Control Program. The public hearing will be held at 3 P.M., June 7, 2021, via Webex.

Meeting URL	https://lbwlevents.webex.com/lbwlevents/onstage/g.php?MTID=efbffd79742179fe7bd45b658d388d724
Event Number	132 012 7622
Event password	2arK35pYJig
Audio Conferenced:	United States Toll +1-408-418-9388
Access code:	132 012 7622

The purpose of the Project Plan is to secure approval of DWSRF funding for the replacement of aging water main, valves, associated fire hydrants and appurtenance located within the City of Lansing's Combined Sewer Separation Areas of 034D, 034E and 015S to improve water quality and reliability and to improve flow efficiency and public health protection.

The estimated cost for the three proposed projects is $19.2 Million. The estimated cost to a typical residential user for the associated DWSRF loans is $0.35 per month. Any grants awarded to the BWL from the DWSRF program would reduce the estimated cost.

On or before May 5, 2021, copies of the draft Project Plan will be available for public review on the Lansing Board of Water & Light's website at: www.lbwl.com/customers/services/water. All interested parties are invited to present comments on the proposed Project Plan. Written comments may be submitted to the Lansing Board of Water & Light, Attn. Mike Lehtonen, 730 East Hazel Street, Lansing, MI 48901, or via e-mail to: Michael.Lehtonen@LBWL.COM. Written comments must be received no later than June 7, 2021, in order for them to be considered as part of the public record.

CP#21-103

AFFIDAVIT OF PUBLICATION

I, Earlisha Scott, am a resident of Lansing, County of Ingham, State of Michigan, and do hereby certify, swear or affirm, that I am competent to give the following declaration based on my personal knowledge, unless otherwise stated, and that the following facts are true and correct to the best of my knowledge: That the attached advertisement - CP#21-103 - Notice of Project Plan - Fishbeck - appeared Wednesday, May 5, 2021 and that City Pulse satisfies the requirements of 1963 PA 247 MCL 691.1051.

WITNESS my signature 5th day of May, 2021

Signature of Declarer

State of Michigan
County of Ingham

This instrument was acknowledged before me on May 5, 2021

By Earlisha Scott

Suzi Smith, Notary Public

My commission expires February 26, 2025

Lansing Board of Water & Light

Public Hearing

Drinking Water State Revolving Fund
Water Distribution Replacement

in cooperation with
The City of Lansing CSO Program

Hometown People. Hometown Power.

Andy Schor, Mayor

Engineers | Architects | Scientists | Constructors

June 7, 2021

Agenda

- History of BWL Water System
- Project Need
- Proposed Projects
- Drinking Water State Revolving Fund (DWSRF)
- Project alternatives and Impacts
- Project Costs & Financing
- DWSRF Process and Schedule
- Questions
- Public Comment

History of the BWL water system…

1885 – Lansing residents approve construction of a water system.

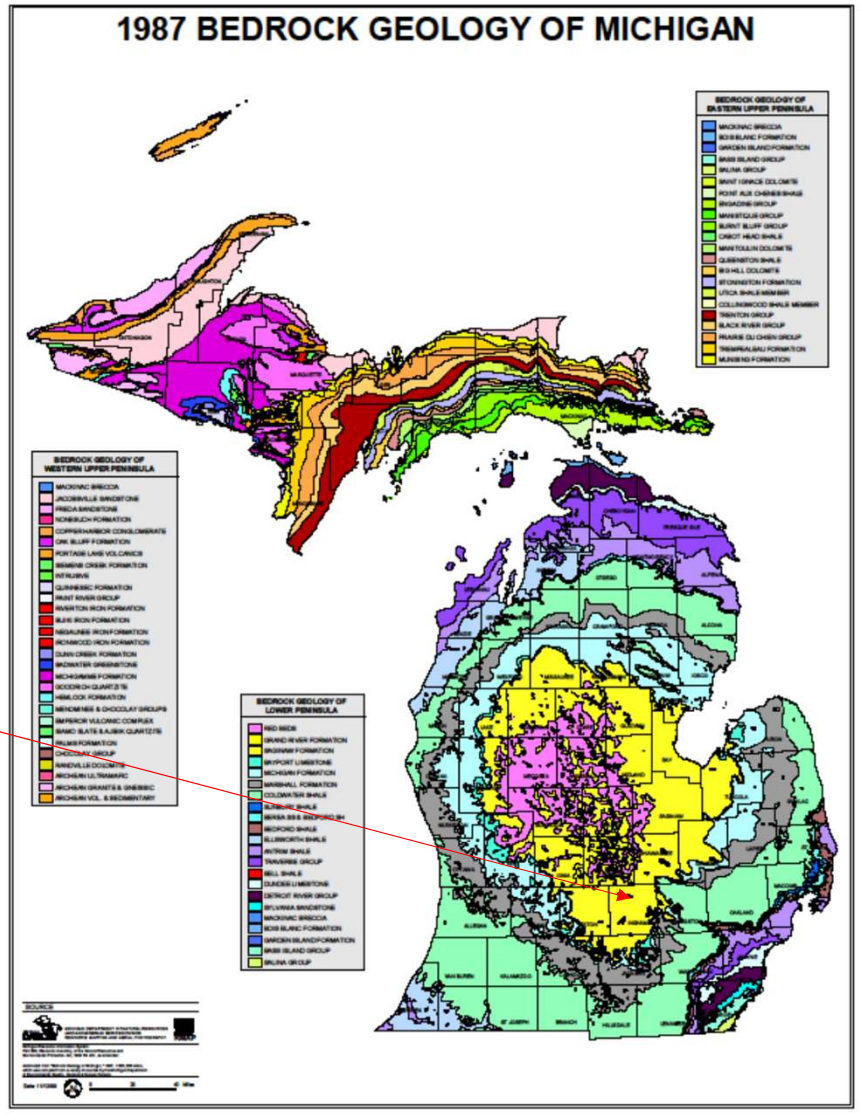
- First municipal bond sold
- First well dug

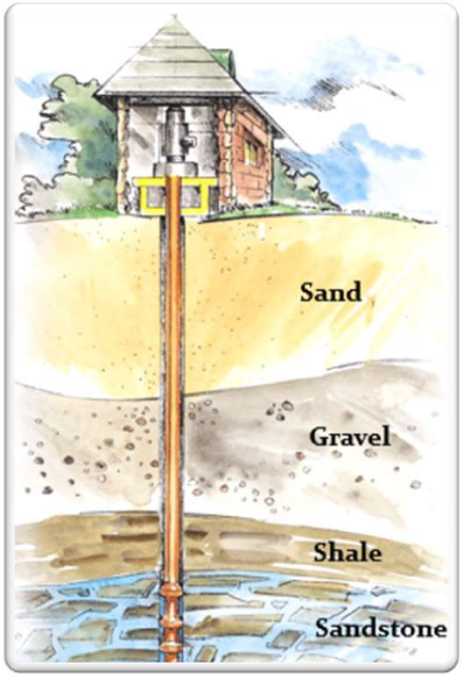
Reasons for water system:

- Fire Protection
- Sanitation
- Public Health Protection
- Quality of Life

Source

- Groundwater source
  - 124 high-capacity wells
  - ~ 400 ft deep
- Saginaw aquifer
- Bedrock
  - Confined, protected





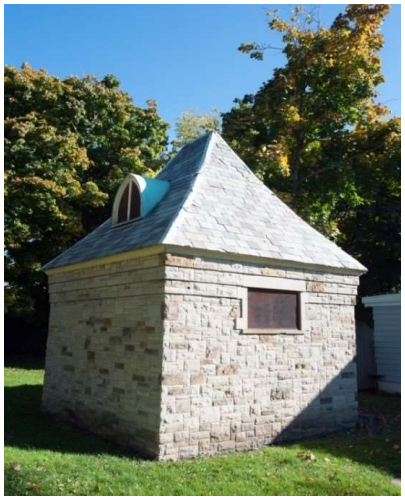
Typical well structure

Raw Water Transmission

- Raw untreated well water pumped to water conditioning plants

Dye Water Plant - 1939

Wise Rd. Water Plant - 1966



BWL wellhouse

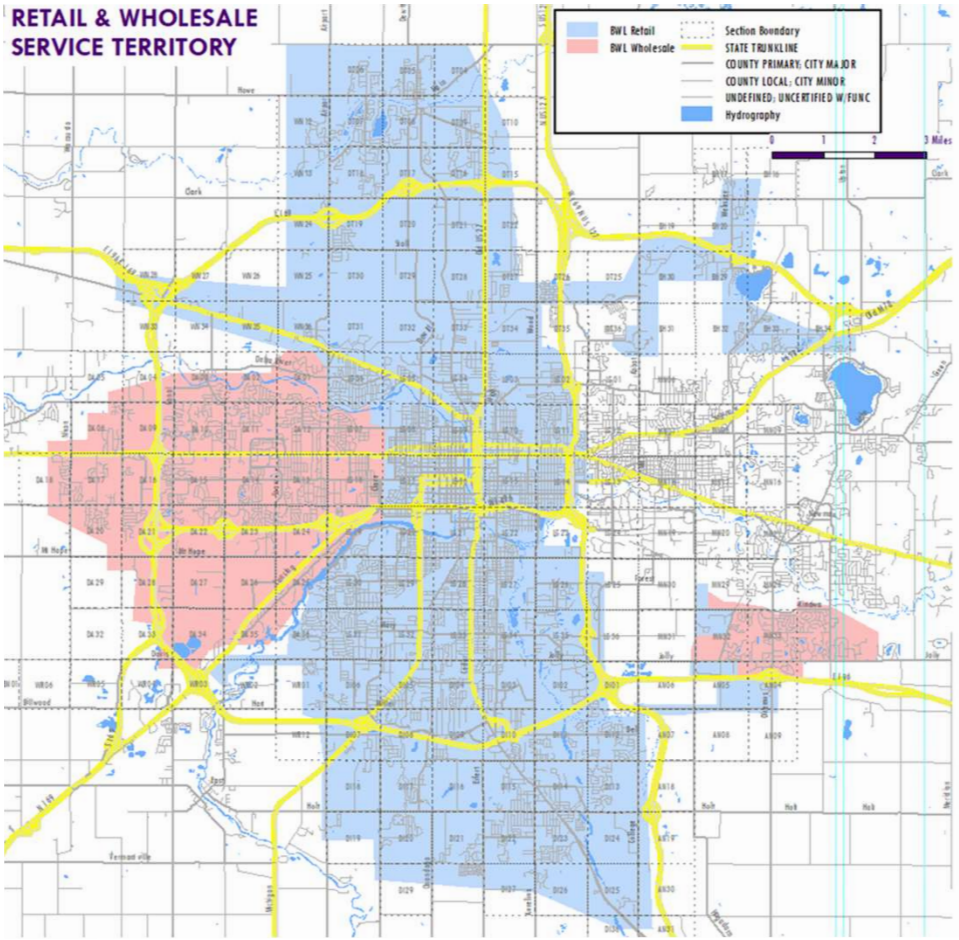
Water Service Territory

- Retail Customers – direct billed. BWL crews provide O&M
  - City of Lansing
  - Lansing Township
  - Delhi Township
  - Dewitt Township
  - City of Dewitt
  - Bath Township
  - Alaiedon Township
  - Watertown Township
  - Windsor Township

- Wholesale Customers – billed through master meter. O&M on their own
  - Delta Township
  - Lansing Township West Side Water
  - Meridian Township (southern Portion of township)

- Total Population Served ~ 208,900*

**2019 EGLE Sanitary Survey*



Water Distribution

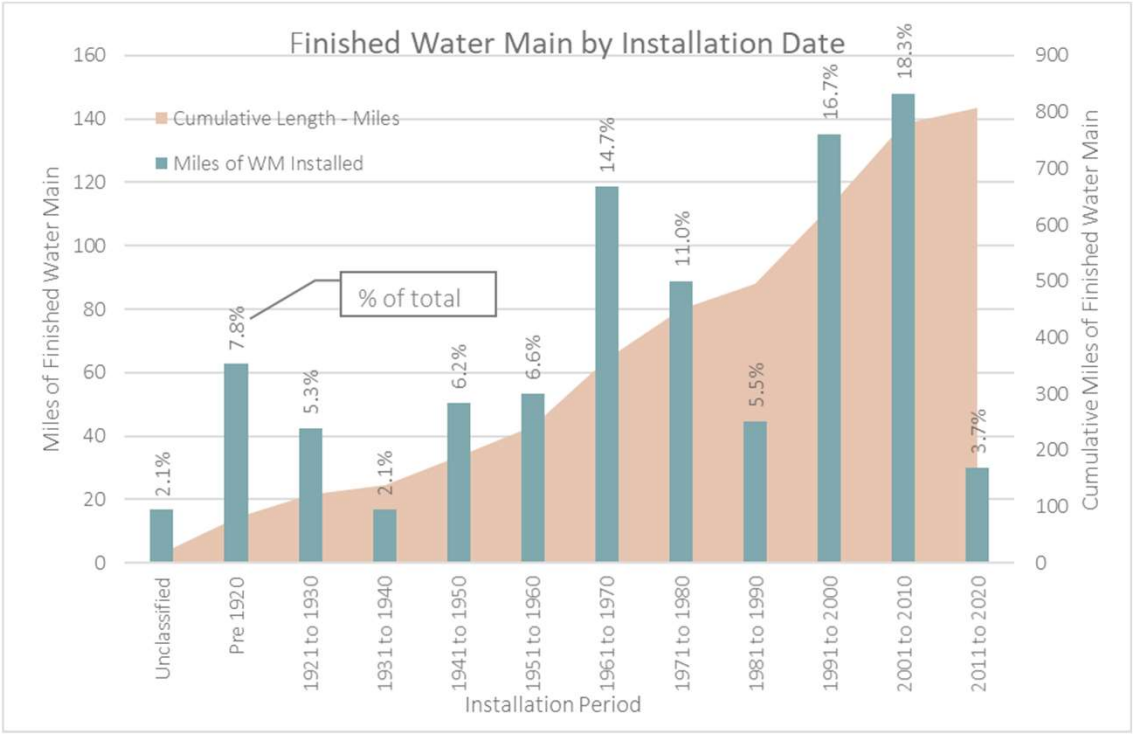
- Water Mains
- 864 miles*
- Mains downtown from the late 1800's / early 1900's
  - Cast iron - old
  - Lined ductile iron – new
- 100-year life cycle
- Frequent breaks are tabulated and main replaced by priority

**From – 2018 Fast Facts*

Need for Projects

Primary reasons for replacement are:

- water main beyond life expectancy
- City of Lansing is preparing to do Combined Sewer Overflow (CSO) sewer separation in these areas

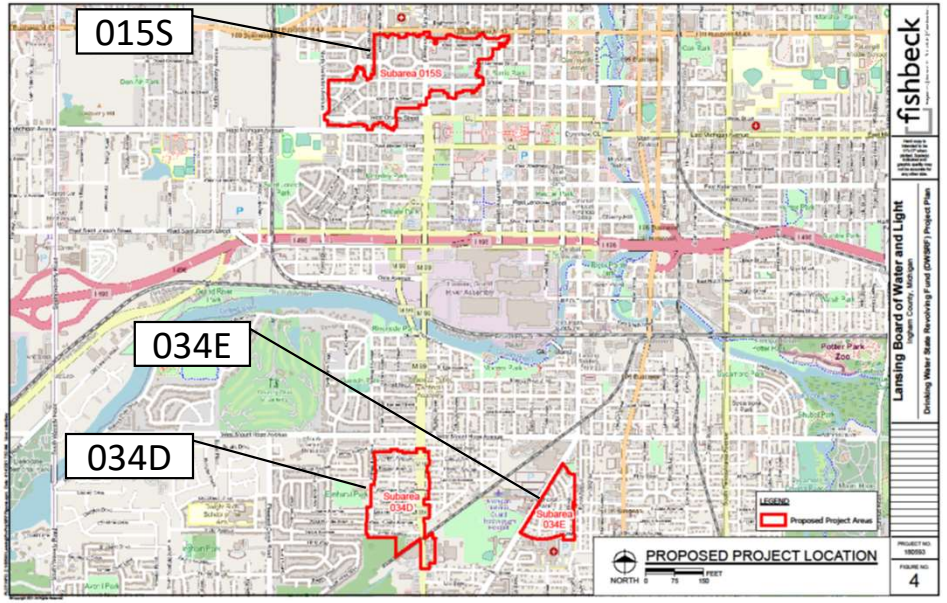


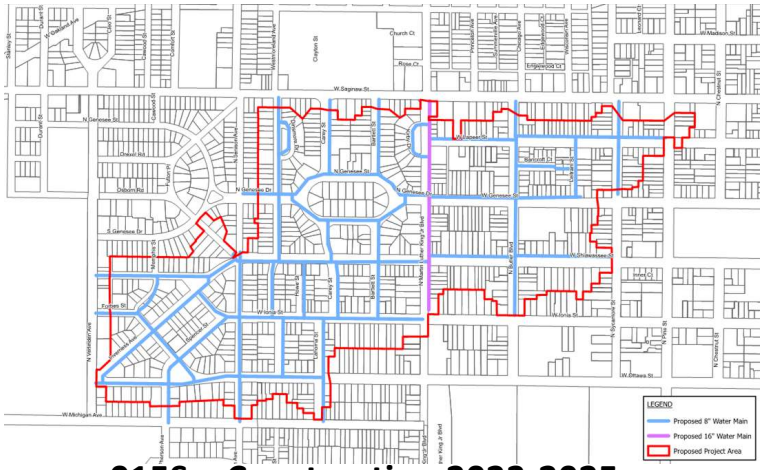
Proposed Projects

- Aging water main will be replaced with new pipe along with valves, fire hydrants and appurtenances.

034D – Construction 2022-2023

034E – Construction 2023





015S – Construction 2023-2025

Drinking Water State Revolving Fund (DWSRF)

- EGLE provides low-interest loans to communities for improving their drinking water systems
- Could be eligible for non-lead infrastructure grant
- The current interest rate is **1.875%**

Project Options

Three alternatives were considered for the water main replacement:

- Alternative 1 – Open Cut Replacement with CSO
- Alternative 2 – Open Cut Replacement without CSO
- Alternative 3 - Replacement through Directional Drill

Alternative 1 most cost effective

Project Impacts

- Temporary construction impacts
- Improvement of drinking water quality and reliability
- Improved flow efficiency and will ensure public health protection by reducing likelihood of coliform outbreaks and nitrification
- Cost efficiencies from partnering with the City of Lansing’s CSO Program
- Minimize disruption to customer

Project Costs and Financing

DWSRF Project

- Estimated Total Cost: **$19.2 Million** (paid for through water rates)

- Upon completion of all construction, the estimated cost to a typical residential water rate payer will be **$0.35 per month**

DWSRF Process & Schedule

The BWL is Required To:

- Prepare a Draft DWSRF Project Plan - Completed
- Advertise for Public Hearing - Completed
- Hold Public Hearing – Today; June 7, 2021
- Secure Board Resolution – June 2021
- Submit Final Project Plan – July 1, 2021

*Construction to Begin in Spring 2022

Questions

This time is reserved for questions from the public regarding this Project Plan Amendment.

Public Comment

- Each resident will have up to five (5) minutes in which to make a comment on the public record.
- Please raise your hand on Webex and you will be admitted to make your comments.
- Please confine comments to items specifically related to the Water Distribution Project Plan.

Thank you

RESOLUTION 2021-06-01

A Resolution Adopting a Final Project Plan for Water System Improvements and Designating an Authorized Project Representative

WHEREAS, the Lansing Board of Water and Light (BWL) is seeking low interest funding to assist in its efforts to improve existing water treatment and distribution systems through the State of Michigan, Department of Environmental Quality's (EGLE) Drinking Water State Revolving Fund (DWSRF); and

WHEREAS, as a requirement of the DWSRF Loan Program, municipalities applying for DWSRF loans are required to submit to EGLE an adopted Project Plan (Project Plan) describing the proposed improvement to existing water treatment and distribution systems program projects; and

WHEREAS, the purpose of the Project Plan is for the replacement of aging water main, valves, associated fire hydrants and appurtenance located within the City of Lansing's Combined Sewer Separation Areas of 034D, 034E and 015S to improve water quality and reliability and to improve flow efficiency and public health protection; and

WHEREAS, the Project Plan for water main replacement will be in partnership with the City of Lansing's Combined Sewer Overflow project; and

WHEREAS, the Lansing board of Water and Light authorized Fishbeck to prepare a Project Plan, which recommends the construction of the following three (3) project areas:

- CSO Subarea 034D Sewer Separation Project; and
- CSO Subarea 034E Sewer Separation Project; and
- CSO Subarea 015S Sewer Separation Project; and

WHEREAS, the estimated total project cost of the three (3) project areas is $ 19.2 Million; and

WHEREAS, a Public Hearing to receive public comment on the proposed Project Plan was held on June 7, 2021 and no public comments were received for consideration; and

NOW THEREFORE BE IT RESOLVED that the Lansing Board of Water and Light formally adopts the Project Plan and agrees to implement the selected alternative - Alternative 1 – Open cut water main replacement in conjunction with City of Lansing Combined Sewer Overflow project.

BE IT FURTHER RESOLVED, that the Water Distribution Principal Engineer, a position currently held by Michael Lehtonen, P.E., is designated as the authorized representative for all activities associated with the project referenced above, including the submittal of said Project Plan as the first step in applying to the State of Michigan for a Drinking Water State Revolving Fund Loan to assist in the implementation of the selected alternative.

Motion by Commissioner Mullen, **Seconded** by Commissioner Leek to approve the Resolution for Adopting a Final Project Plan for Water System Improvements and Designating an Authorized Project Representative**.**

Yeas (names of Members voting Yes): Commissioners David Price, DeShon Leek, David Lenz, Tony Mullen, Ken Ross, Tracy Thomas, and Sandra Zerkle.

Nays (names of Members voting No): None

I certify that the above Resolution was adopted by Board of Water and Light Board of Commissioners (the governing body of the applicant) on June 17, 2021.

BY: M. Denise Griffin
Name (please print or type)

Corporate Secretary
Title

M. Denise Griffin
Digitally signed by M. Denise Griffin
DN: cn=M. Denise Griffin, o=Lansing Board of Water and Light, ou, email=MDenise.Griffin@lbwl.com, c=US
Date: 2021.06.25 09:24:02 -04'00'
Signature

June 17, 2021
Date