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CIP

Capital Improvement Plan
2019 - 2023

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GLWA

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I. OVERVIEW

SECTION 1 GREAT LAKES WATER AUTHORITY

The Great Lakes Water Authority (GLWA) was incorporated by the City of Detroit and the Counties of Macomb, Oakland and Wayne on November 26, 2014 pursuant to Act 233, Public Acts of Michigan, 1955, as amended. At the time of GLWA's incorporation, the City, through its Detroit Water and Sewerage Department (DWSD), was providing water supply services and sewage disposal services within and outside of the City of Detroit. On June 12, 2015, the City and GLWA executed a regional water system Lease, a regional sewage disposal system lease and a water and sewer services agreement, and as of December 1, 2015, the City and GLWA executed a shared services agreement. The foregoing agreements became effective on January 1, 2016, at which time GLWA, pursuant to the Lease, became responsible for the debt obligations of the City relating to the Water System, including the payment of all DWSD Water Bonds, through the substitution of GLWA for the City as the sole obligor on the DWSD Water Bonds, the assignment to GLWA of all of the revenues of the Water System, and the assumption by GLWA of the DWSD Water Bonds.

The Authority operates the regional water system and the regional sewer system (each as defined herein) for Southeast Michigan pursuant to the leases and the Water and Sewer Services Agreement. The governance structure of the Authority gives suburban water and sewer customers a substantial collaborative role in the direction of one of largest water and wastewater utilities in the nation, while also providing the City's local systems the benefits of the Authority's regional strengths. While GLWA manages and controls all regional water and wastewater wholesale services, the City and the suburban customer communities retain control of local water and sewer services within their respective borders. The City also acts as agent of GLWA with respect to setting, billing, collecting and enforcing local retail charges. Prior to January 1, 2016, DWSD's financial activities were largely governed by a series of federal court orders designed to separate the management of the regional water and sewer enterprises from local City control and to ensure environmental compliance. In contrast, GLWA is a legally independent, regional authority created pursuant to State law, governed by its own independent Board of Directors and primarily overseen, as to environmental matters, by the Michigan Department of Environmental Quality (MDEQ), as are all water and sewer service providers in the state, and the federal Environmental Protection Agency (EPA).

The new Authority has adopted an unwavering commitment to its customer communities, known as "One Water," with a strong mission statement of customer collaboration and engagement:

> *"Through regional collaboration, GLWA strives to be the provider of choice dedicated to efficiently delivering the nation's best water and sewer service in partnership with our customers."*

In open partnership with its customers, GLWA is focused on innovation in its business practices, with a commitment to providing the highest quality product and services to current and future generations.

The regional water system has a long history of providing reliable service and water quality with the Great Lakes as its source and five water treatment plants, with capacity well in excess of current and projected demands. In light of this capacity, GLWA has undertaken plans to market water services to potential new

wholesale customers, as well as to right-size its facilities for financial and operational optimization of the regional water system.

1.1. Powers of the Authority

GLWA is a public body corporate organized pursuant to the provisions of Act 233. In addition to this statutory authority, the governance for the Authority is found in its Articles of Incorporation, By-Laws, policies, and ordinances including but not limited to its bond ordinances. The Authority has both express powers and implied powers necessary to carry out its powers, duties, and responsibilities. GLWA's express powers include the following:

The Authority is empowered through its Board of Directors to provide wholesale water and wastewater service to the service area. The six-member GLWA Board has the authority to execute contracts, set policy for the Authority, set service charges and set the revenue requirement for the customers.

The GLWA Board is required to appoint an Audit Committee to "review the reports related to the financial condition, operations, performance and management of the Authority" on a regular basis. Certain actions by the GLWA Board require the affirmative vote of at least five of its members, including, but not limited to, setting charges for water and sewer services, annual operating budgets, capital improvement programs, issuance of debt and any modification of the Lease.

The Authority shall formally adopt a two-year operating budget, consistent with Section 5 of the Articles of Incorporation. The two-year operating budget shall require the affirmative vote of five members.

The Authority has the ability to enter into water supply and sewage disposal contracts and may establish and fix a schedule of fees and other charges for its services.

1.2. Governance and Board Members

The GLWA Board of Directors (GLWA Board) is comprised of six voting members. Two members are residents of the City of Detroit and are appointed by the Mayor of the City of Detroit. The Counties of Macomb, Oakland, and Wayne each appoint one member who is a resident of the County from which appointed and the Governor of the State of Michigan appoints one member who is a resident of an area served by the Authority outside of the Counties. All members of the GLWA Board must have at least seven years of experience in a regulated industry, a utility, engineering, finance, accounting or law. After the initial term specified in the Articles of Incorporation, each GLWA Board member is appointed for a four-year term and serves at the pleasure of the appointing authority.

In order to more efficiently oversee the Authority's operations, the GLWA Board has adopted a committee structure. Four committees have been established: (i) Audit, (ii) Capital Improvement Planning, (iii) Operations and Resources and (iv) Legal.

The GLWA Board currently consists of:

- *Robert J. Daddow, CPA, GLWA Board Chairman; Representative for Oakland County*
- *Freman Hendrix, GLWA Board Vice Chairman; Representative for the City of Detroit*
- *Brian Baker, GLWA Board Secretary; Representative for Macomb County*
- *Gary A. Brown, GLWA Board Representative for the City of Detroit*
- *Craig Hupy, GLWA Board Representative for the State of Michigan*
- *Abe Munfakh, GLWA Board Representative for Wayne County*

The GLWA Capital Improvement Planning committee provides significant input, direction and evaluation of the 2019-2023 CIP. Members of the CIP committee include:

- *Gary A. Brown, CIP Committee Chairman*
- *Robert J. Daddow, CPA*
- *Craig Hupy, P.E.*

1.3. Executive Leadership Team

GLWA's Executive Leadership Team has operated the Water System since 2012, and is continuing to optimize the organization through innovative job designs, lean business practices and the greater use of technology. These organizational optimization initiatives have already resulted in performance improvements in all aspects of Water and Wastewater System operations, from environmental compliance to customer satisfaction, and have materially improved the Water System's financial metrics and results. GLWA continues on its path of performance improvement with a new focus on its role in the economic success and the public health and safety of the region it serves.

The GLWA Executive Leadership Team is committed to building upon the history of improved performance of the Water System and the Sewer System that began in 2012. GLWA key personnel are:

- *Sue F. McCormick, Chief Executive Officer*
- *William M. Wolfson, Chief Administrative and Compliance Officer/General Counsel*
- *Nicolette N. Bateson, CPA, Chief Financial Officer/Treasurer, Financial Services*
- *Cheryl Porter, Chief Operating Officer, Water & Field Services*
- *Terri Tabor Conerway, Chief Organizational Development Officer*
- *Suzanne R. Coffey, P.E., Chief Planning Officer; Interim Chief Operating Officer, Wastewater*
- *W. Barnett Jones, Chief Security and Integrity Officer*
- *Michelle A. Zdrodowski, Chief Public Affairs Officer*
- *Jeffrey E. Small, Chief Information Officer*
- *Randal M. Brown, General Counsel*

1.4. Service Area and Customer Relationships

The Authority's Water System is one of the largest in the United States, both in terms of water produced and population served. The Water System currently serves an area of 981 square miles located in eight Michigan counties and an estimated population of nearly 4 million or nearly 40% of Michigan's population. Suburban customers comprise approximately 82% of the population served by the Authority, and the Retail Water Customers (as defined herein) comprise the remainder served by the Authority.

SECTION 2 CIP STRATEGY

GLWA's Capital Improvement Plan (CIP) supports the continuation of major capital asset investment in programs and projects that will upgrade the Authority's aging water and wastewater system infrastructure, as well as the overarching Centralized Service infrastructure that supports both systems. The CIP is a five-year plan which identifies capital projects and programs and their respective financing options. Annually, this plan is updated to reflect changing system needs, priorities and funding opportunities.

"At GLWA the capital replacement strategy that we are striving for is to increase resiliency of water and wastewater systems, adhere to long-term planning document recommendations,

active solicitation of stakeholder input and to be the best-in-class planning and execution"

Projects and programs established in the CIP are identified and recommended from many different sources. Several projects are permit and regulatory requirements, while others have been identified in master plans, condition or need assessments. The latter of which make up the primary sources of projects within the CIP. In addition, other projects and programs are brought forward by operations and maintenance personnel tasked with continually providing a high level of service and by the engagement of our stakeholders – in particular, an engaged customer community.

Based upon their long-term nature toward achieving a strategy, master plan capital recommendations make up a significant number of the projects. GLWA's Comprehensive Water Master Plan was completed in 2015 is a twenty-year planning tool that addresses optimization of an aging water system by recognizing that there is excess capacity from decreasing usage and a stable population while never compromising quality. GLWA's Comprehensive Regional Wastewater Master Plan will replace the existing 2003 wastewater master plan. This master plan focuses on the new dynamic of a regional authority to provide regional collaboration and planning to minimize capital expenditures while exceeding levels of service.

This CIP should be considered a planning document – it is a dynamic and evolving plan that requires continual review and modification during the course of each year. The estimates indicated in the early years of the report are likely more precise than those in the later years because anticipated projects in the early years are typically better defined by studies or scoped by design than projects conceptual in nature in the out years of the plan. The project descriptions and summaries represent brief synopses of the entire project scope; these descriptions are generally more precise for ongoing active projects than for newly planned projects, where specific project activities may have yet to be determined.

Based upon the execution of programs and projects identified in the CIP, existing levels of service currently provided will be met or exceeded.

Copies of this CIP and past CIPs are available on GLWA's website at http://www.glwater.org/about-us/capital-improvement-planning-committee/.

2.1. Funded Portion of the Programs

This plan spans a 5-year period from 2019 through 2023. The CIP review process also includes an extensive review of the total project, or "lifetime" budget, which reflects historical spending prior to, during, and beyond the current 5-year period. The goal of the Authority's capital financing strategy is to align capital project financing sources with multiple goals including: (a) recovering the costs of capital investment over the useful lives of the capital assets; (b) minimizing the impact of the capital programs on water and sewage revenue requirements; and (c) protecting and enhancing the Authority's financial position. The potential funding source identified for each project is subject to change based upon the systems need and financial resources available at the time.

SECTION 3 LARGEST DOLLAR PROJECTS (GREATER THAN $30M)

The water and wastewater projects with the largest projected spend for the FY2019-2023 CIP are listed below. These projects are budgeted for greater than $30 Million over the FY2019-2023 time period. There are 11 projects in the Water category and eight projects in the Wastewater category.

3.1. Water

Table I-1. Water Projects with 2019-2023 CIP Total Greater than $30M

CIP #	Project Title	Lifetime Actual Thru FY16	Actual FY17	Projected Expenditures									Useful Life >20	Cost Allocation
				FY18	FY19	FY20	FY21	FY22	FY23	FY24	2019-23 CIP Total	Project Total		
111001	LH WTP Low Lift Pumping, Filter Backwash Pumps & Flocculation Improvements	$0	$0	$0	$0	$4,071	$1,162	$10,350	$20,075	$19,575	$35,658	$55,233	Yes	CTA
112003	NE WTP High-Lift Pumping Station Electrical Improvements	0	0	0	0	3,488	15,750	15,750	15,750	14,550	50,738	65,288	Yes	CTA
113003	SW WTP Low and High Lift Pumping & Rapid Mix Chamber BFVs, Sluice Gates, Flocculation & Filtration System Improvements	0	0	12	50	6,222	6,222	17,675	25,190	94,720	55,359	150,091	Yes	CTA
115001	WWP WTP Yard Piping, Valves and Venturi Meters Replacement	0	9	2,050	1,831	25,150	25,140	0	0	0	52,121	54,171	Yes	CTA
116002	Pennsylvania, Springwells and Northeast Raw Water Supply Tunnel Improvements	0	10	4,651	14,651	20,224	379	0	0	0	35,254	39,905	Yes	CTA
122003	Waterworks Park WTP to Northeast WTP Transmission Main	0	19	2,500	6,604	20,050	35,050	34,050	32,050	0	127,804	130,304	Yes	CTA
122004	96-inch Main Relocation, Isolation Valves Installations, and New Parallel Main	0	460	1,678	3,684	6,292	20,926	49,684	43,734	6,464	124,320	132,462	Yes	CTA
122013	14 Mile Transmission Main Loop	0	0	42	1,694	3,380	11,578	19,581	14,682	3,589	50,915	54,546	Yes	CTA
132010	West Service Center PS - Duval Rd Division Valve Upgrades	0	0	33	2,050	11,050	11,050	11,050	2,025	0	37,225	37,258	Yes	CTA
170100	Water Treatment Plant /Pump Station Allowance	3,009	3,768	9,935	9,956	10,000	10,000	10,000	10,000	0	49,956	59,891	Yes	CTA
170400	Water Transmission Improvement Program	120	955	40	9,910	9,910	9,910	9,910	9,910	0	49,550	49,590	Yes	CTA

3.2. Wastewater

Table I-2. Wastewater Projects with 2019-2023 CIP Total Greater than $30M

CIP #	Project Title	Lifetime Actual Thru FY16	Actual FY17	Projected Expenditures									Useful Life >20	Cost Allocation
				FY18	FY19	FY20	FY21	FY22	FY23	FY24	2019-23 CIP Total	Project Total		
211001	WRRF Rehabilitation of Primary Clarifiers Rectangular Tanks, Drain Lines, Electrical/Mechanical Building and Pipe Gallery	$14	$10,229	$12,518	$22,983	$9,002	0	0	0	0	$31,985	$44,503	Yes	CTA
222001	Oakwood District Intercommunity Relief Sewer Modification at Oakwood District	0	0	0	600	13,200	12,700	11,500	0	0	38,000	38,000	Yes	CTA
232001	Fairview Pumping Station - Replace Four Sanitary Pumps	0	778	500	12,090	14,410	3,970	0	0	0	30,470	30,970	Yes	CTA
260100	WRRF, Lift Station and Wastewater Collection System Structures Allowance	2,024	12,734	5,428	10,920	12,010	10,920	13,100	12,000	0	58,950	64,378	Yes	CTA
260200	Sewer and Interceptor Evaluation and Rehabilitation Program	0	3,397	10,001	8,484	21,060	20,000	17,058	0	0	66,602	76,603	Yes	CTA
260300	Scheduled Replacement Program of Critical Assets	0	56	2,751	6,000	6,000	6,000	6,000	6,000	0	30,000	32,751	Yes	CTA
260500	CSO Outfall Rehabilitation	0	0	7,471	11,960	11,961	8,969	5,973	5,973	0	44,836	52,307	Yes	CTA
260600	CSO FACILITIES IMPROVEMENT PROGRAM	0	764	1,598	11,699	6,497	14,850	26,950	17,450	2,450	77,446	81,494	Yes	83/17

SECTION 4 LARGEST 2019 PROJECTED SPEND (GREATER THAN $8M)

The water and wastewater projects with the largest projected spend for 2019 are listed below. These projects are budgeted for greater than $8 Million in FY 2019. There are five projects in the Water category and ten projects in the Wastewater category.

4.1. Water

Table I-3. Water Projects with 2019 Projected Spend Greater than $8M

CIP #	Project Title	Lifetime Actual Thru FY16	Actual FY17	Projected Expenditures									Useful Life >20	Cost Allocation
				FY18	FY19	FY20	FY21	FY22	FY23	FY24	2019-23 CIP Total	Project Total		
111006	LH WTP Replacement of Filter Instrumentation and Raw Water Flow Metering Improvements	$1	$252	$549	$10,428	$10,414	$4,582	0	0	0	$25,424	$25,973	Yes	CTA
115004	WWP WTP Chlorine System Upgrade	0	371	912	8,882	0	0	0	0	0	8,882	9,794	Yes	CTA
116002	Pennsylvania, Springwells and Northeast Raw Water Supply Tunnel Improvements	0	10	4,651	14,651	20,224	379	0	0	0	35,254	39,905	Yes	CTA
170100	Water Treatment Plant /Pump Station Allowance	3,009	3,768	9,935	9,956	10,000	10,000	10,000	10,000	0	49,956	59,891	Yes	CTA
170400	Water Transmission Improvement Program	120	955	40	9,910	9,910	9,910	9,910	9,910	0	49,550	49,590	Yes	CTA

4.2. Wastewater

Table I-4. Wastewater Projects with 2019 Projected Spend Greater than $8M

CIP #	Project Title	Lifetime Actual Thru FY16	Actual FY17	Projected Expenditures									Useful Life >20	Cost Allocation
				FY18	FY19	FY20	FY21	FY22	FY23	FY24	2019-23 CIP Total	Project Total		
211001	WRRF Rehabilitation of Primary Clarifiers Rectangular Tanks, Drain Lines, Electrical/Mechanical Building and Pipe Gallery	$14	$10,229	$12,518	$22,983	$9,002	0	0	0	0	$31,985	$44,503	Yes	CTA
212006	WRRF Rouge River Outfall (RRO) Disinfection (Alternative)	912	5,961	20,493	18,139	1,798	0	0	0	0	19,937	40,430	Yes	CTA
213007	WRRF Modification to Incinerator Sludge Feed Systems at Complex -II	0	0	7,035	10,999	3,352	0	0	0	0	14,351	21,386	Yes	CTA

CIP #	Project Title	Lifetime Actual Thru FY16	Actual FY17	Projected Expenditures									Useful Life >20	Cost Allocation
				FY18	FY19	FY20	FY21	FY22	FY23	FY24	2019-23 CIP Total	Project Total		
222002	Detroit River Interceptor (DRI) Evaluation and Rehabilitation	0	5	2,222	11,569	6,600	0	0	0	0	18,169	20,391	Yes	CTA
222003	North Interceptor East Arm (NIEA) Evaluation and Rehabilitation	0	0	0	11,000	12,000	3,000	0	0	0	26,000	26,000	Yes	OMID
232001	Fairview Pumping Station - Replace Four Sanitary Pumps	0	778	500	12,090	14,410	3,970	0	0	0	30,470	30,970	Yes	CTA
260100	WRRF, Lift Station and Wastewater Collection System Structures Allowance	2,024	12,734	5,428	10,920	12,010	10,920	13,100	12,000	0	58,950	64,378	Yes	CTA
260200	Sewer and Interceptor Evaluation and Rehabilitation Program	0	3,397	10,001	8,484	21,060	20,000	17,058	0	0	66,602	76,603	Yes	CTA
260500	CSO Outfall Rehabilitation	0	0	7,471	11,960	11,961	8,969	5,973	5,973	0	44,836	52,307	Yes	CTA
260600	CSO FACILITIES IMPROVEMENT PROGRAM	0	764	1,598	11,699	6,497	14,850	26,950	17,450	2,450	77,446	81,494	Yes	83/17

II. DEVELOPMENT & FEATURES

SECTION 1 APPROVAL PROCESS

The CIP development and approval process begins with the approval of the previous year's CIP. The CIP process is a substantial level of effort that involves many team members throughout the Authority. Modifications, adjustments and improvements are being continuously considered and vetted internally and externally through various Customer Outreach Work Groups. Projects and programs that ultimately get funded within the CIP are typically identified based upon master planning or condition/need assessment efforts. Projects also are identified internally based upon the needs of engineers, operations or maintenance staff. An internal effort to coordinate and prioritize all identified projects is conducted to ensure the appropriate projects are being funded in a prioritized manner.

The process typically begins in the summer of each year when modifications to the CIP itself, requested project information and process are developed. These changes are rolled out and project manager training on modifications to the CIP process and documentation occurs. At this time, an Authority-wide request for project proposals and the request for the completion of the Business Case Evaluation documentation is made to all business areas throughout the Authority. Business case evaluations from project managers are due to the Financial Services Area by late summer. At this time, a CIP number is created for each new project included in the 5-year CIP.

Typically, in September, the Water and Wastewater Review Committees will meet to prioritize newly submitted CIP projects for the upcoming fiscal year. For this CIP, the projects, programs and allowances that are currently active have not been prioritized by these committees as they are currently underway.

A draft of the CIP is compiled typically in early fall. That draft report and back-up documentation are reviewed internally with the Asset Management and CIP work area team, management, Chief Financial Officer/Treasurer (CFO) and the Authority's financial planning consultant. The Financial Services Area provides prior year actual expenses based upon unaudited financials typically in October.

With projects vetted internally, the draft CIP is presented and comments and feedback solicited from the Asset Management & CIP Customer Outreach Work Group, the GLWA Capital Improvement Planning Committee and the Authority's customer communities. Formal comments to this plan are due approximately one month after the first external presentation. However, throughout this process all feedback, comments and suggestions are welcomed. Based upon customer and Board feedback, the CIP is modified and at this point, it is expected that the CIP approval process coincides with the overall budget development and approval process.

SECTION 2 CALENDAR

The schedule below is subject to change based upon other outstanding circumstance beyond the control of GLWA. The calendar is based upon current and best available data. Specific approval dates and coordination with the GLWA Board of Directors is necessary to identify key milestones leading up to the ultimate approval of the 2019-2023 CIP.

Date	Description
October 2017	Review Committee Meetings
October 12, 2017	Executive Leadership Team Reviews BCE's & Modifications to CIP
October 24, 2017	Introduce New BCE's & Major CIP Modifications to AM/CIP Customer Outreach Work Group
November 2017	Executive Leadership Team Reviews BCE's & Modifications to CIP
December 15, 2017	First GLWA CIP Committee Review of CIP – Version 1
December 19, 2017	First Customer Review of CIP – Version 1 at Customer Charges Rollout Meeting #1
January 19, 2018	Second GLWA CIP Committee Review of CIP – Version 2
January 23, 2018	Second Customer Review of CIP – Version 2 at AM/CIP Customer Outreach Work Group
January 24, 2018	First GLWA Board Meeting for Review of CIP – Introduction
February 28, 2018	Second GLWA Board Meeting – Proposed CIP Adoption
March 14, 2018	Proposed Alternate GLWA Board Meeting for CIP Adoption
July 1, 2018	Effective Date of 2019-2023 CIP

SECTION 3 BUSINESS CASE EVALUATION DEVELOPMENT

3.1. Project Prioritization

GLWA has continued to utilize the project prioritization tool to provide a standardized method of prioritizing projects for the annual GLWA CIP development. This prioritization tool attempts to quantify a project ranking to allow for objective prioritization. When asset management information is available on the asset level, the information will be used to supplement the Business Case Evaluation process to ensure the effective and efficient use of public funds. The CIP development and prioritization process results in a prioritized list of projects with anticipated CIP year, schedule and overall cost for inclusion within the official five-year CIP.

Currently, projects to be considered for inclusion in each year of the CIP are identified by the subject matter expert engineers or project managers. These engineers and project managers utilize available institutional knowledge, data, operations and maintenance reports, need and condition assessments and master plans to identify the project need. The following criteria have been identified to capture GLWA's overall strategy related to the probability and consequence of failure associated with each identified project: (i) condition, (ii) performance (Service Level/Reliability), (iii) operations & maintenance, (iv) regulatory (environmental & Legal), (v) public health & safety, (vi) public benefit, (vii) financial and (viii) efficiency and innovation.

The results of the project prioritization by each project manager and by the individual review committees are included in Chapter V. These provide a quick glance prioritization of each project as they relate to others. This will be very useful to identify lower priority projects that may be delayed in the event of emergencies

that may redirect funding away from the existing project or to prioritize procurement activities.

3.2. Review Committee

Currently, each New and Future Planned projects are scored by the project manager during the completion of a standardized Business Case Evaluation form and by a Review Committee. The Review Committee is comprised of a core group of members from leadership in the Financial Service Group, Planning Services Group, and from the business unit associated with Water or Wastewater Service Area. To facilitate transparency in this process, a member from one or more of GLWA's customer communities also participates as a scoring member of the Review Committee. The 2019-2023 Capital Improvement Program Development Water and Wastewater Review Committee members are identified below in Table II-1 and Table II-2, respectively.

Table II-1. Water Review Committee Members

Name	Group
Karen Mondora	Customer Representative – City of Farmington Hills
Jody Caldwell	GLWA Systems Planning
Cheryl Porter	GLWA Water Operations
Terry Daniel	GLWA Water Operations
Biren Saparia	GLWA Systems Control/Field Services
Shaker Manns	GLWA Energy Management
Grant Gartrell	GLWA Water Engineering
Scott Schultz	GLWA Financial Services
Chandan Sood	GLWA Systems Analytics & Meter Operations

Table II-2. Wastewater Review Committee Members

Name	Group
Sam Smalley	Customer Representative – Detroit Water and Sewer Department
Jody Caldwell	GLWA Systems Planning
Suzanne Coffey	GLWA Wastewater Operations
Majid Khan	GLWA Wastewater Operations
Ali Khraizat	GLWA Wastewater Engineering
Philip Kora	GLWA Wastewater Construction Engineering
Wendy Barrott	GLWA Planning Services Group
Biren Saparia	GLWA Systems Control/Field Services
Shaker Manns	GLWA Energy Management
Anjanette Custard	GLWA Financial Services
Dan Alford	GLWA Wastewater Maintenance
Chandan Sood	GLWA Systems Analytics & Meter Operations

3.3. BCE Guidance Document

To aid in evaluating and understanding the project prioritization and process, a Capital Improvement Project Prioritization Guidance Document has been developed. This document details the purpose of the prioritization tool, identifies the anticipated CIP schedule and key milestones, provides details about each criteria and the associated weighting factor and demonstrates the overall prioritization calculation. Most importantly, this document provides the detailed guidance related to each category and displays examples of the information needed for project managers or the review committees to make accurate scoring decisions. In addition, as this methodology continues to evolve within the Authority, it is anticipated that future BCE's will contain specific data related to each criteria being evaluated thus creating a better and more well defined project justification that can be easily relatable to other projects submitted.

SECTION 4 KEY FEATURES

4.1. Project Status Description

In order to determine a particular projects progress within the CIP, a status is assigned to each project within the CIP. The project status designation provides a high-level understanding of the progress. Projects are often divided into multiple phases or categories based upon the contract type. As such, each phase of a multi-phase project will have its own status and contract number. Descriptions of each particular status are provided in Table II-3 on the following page.

Table II-3. Project status descriptions

Project Status	Description
New	Project that has never been included in a previous CIP.
Future Planned	Project that has been included in the previous CIP, has never had expenditures charged to it and does not have an assigned BS&A Project Number
Active	Project that has an assigned BS&A Project Number in the financial system and one or more phases have at least began the procurement process.
Pending Close-out	Project that has an assigned BS&A Project Number, a Notice to Start Work has been issued, has projected expenditures for the current fiscal year equal to $100,000 or less - with no future projected expenditures and has reached substantial completion.
Closed	Project that has been officially completed.
Reclassified	Project that has been merged into the scope of work of an existing project.
Cancelled	Project that has been completely cancelled and removed from the CIP.
Archived	Project that has been identified as Closed within the CIP the previous year.

4.2. Phase Categories

Often projects are broken up into several phases related to how the particular project will be delivered and managed. Categories may be grouped to align with work to be performed within each individual phase. Individual categories are identified and named below, however, in reality several categories may exist for each phase. In this case, this implies the same vendor, under one contract, will be performing multiple categories of the overall project. The current project categories are identified below.

S.....Study
D.....Design
C .....Construction
CA .....Construction Assistance
DB .....Design and Build
DBA.....Design Build Assistance
CM.....Construction Management
IA.....Intergovernmental Agreement*
PO .....Purchase Order
PM .....Project Management

*This is pursuant to the Act 35 of 1951, Intergovernmental Contracts Between Municipal Corporations, which can be viewed at http://www.legislature.mi.gov/documents/mcl/pdf/mcl-act-35-of-1951.pdf.

4.3. CIP Types

Multiple CIP types are necessary to distinguish the differences in intent of how a particular CIP item is to be used. This CIP contains three primary CIP types: Project, Program, and Allowance. A typical project that has a specific scope and timeframe is considered a Project. Whereas Programs and Allowances do not have specifically developed scopes and typically extend over many years. Allowances are necessary for utility operations due to the unanticipated nature of pipeline and equipment failures that require immediate repair and rehabilitation to continuously meet level of service requirements. Table II-4 defines each CIP Type.

SECTION 5 REPORT FORMAT

The 2019-2023 CIP format has been modified to provide a document that is more transparent, navigable and user friendly.

5.1. Varying Degrees of Project Detail

Within the document, projects and programs will be portrayed in varying degrees of detail that should meet the needs of most readers. Projects can be viewed in the basic line item format that provides general information about the project and the projected expenditures. Within this format, projects will be rolled up by their major category of Water, Wastewater and Centralized Services. Totals will be provided. Projects will also be identified separately within each category to provide the reader more information on the type and amount of each project within specific service areas. One-page summaries of each project (old and new) are newly created and give the reader more detail of the project phases, purpose, scope of work and potential challenges. Finally, for greater detail on each project, the BCE documents are provided in Appendix A, B and C.

Table II-4. CIP Types

CIP Type	Description
Project	A "Project" consists of the replacement and/or rehabilitation of specific capital assets within a finite timeframe and scope.
Program	A "Program" consists of the replacement and/or rehabilitation of specific capital assets on an ongoing or reoccurring basis. The program scope and/or projected expenses may vary from year-to-year depending on the needs identified within the program and as newly established programs develop consistent schedules, requirements and history over time. Although not typically identified in the CIP future years projected expenses, these programs will typically be funded in perpetuity.
Allowance	An "Allowance" consists of unanticipated replacement and/or rehabilitation of currently unidentified capital assets. Engineering studies, evaluations, testing, construction assistance directly related to the unforeseen replacement or rehabilitation are also included in the projected expenses.

5.2. Revised Project Categories & Numbering

The revised categorization methodology and numbering scheme of CIP projects and programs introduced in the 2018-2022 CIP is continued in the 2019-2023 CIP. The project characterization is extremely beneficial to align CIP project budgets by managing business area cost centers. In addition, these directly align with costs centers in the operating budget within the Authority's financial system.

One nuance with the 2019-2023 CIP is that the projects that have been created within a program or an allowance have been given a new CIP number. This is required within the BS&A Financial system to accurately track and report expenses incurred. These project "carve outs" have been shown within this CIP as phases within the parent program or allowance.

This numbering is based on the "smart" numbering system as identified in Table II-5 below.

5.3. General Purpose

The General Purpose category within Project Category 2 and Project Category 3 in Table II-5 are necessary to identify projects that cross over multiple project categories. Projects that are not specifically attributed to one particular area will be identified here.

5.4. Programs

As identified previously, programs consist of the replacement and/or rehabilitation of specific capital asset on an ongoing or reoccurring basis. The program scope and/or projected expenses may vary from year-to-year, depending on the needs identified within the program, and as newly established programs develop consistent schedules, requirements and history over time. Although not typically identified in the CIP future years projected expenses, these programs will typically be funded in perpetuity. The numbering structure of the "Program" category is slightly different in order to allow up to 99 separate projects to be attributable to each program. As discussed previously, these projects identified under a parent program will be issued a CIP number, however will be displayed within the CIP as a phase of the overall parent program.

Table II-5. Capital Project/General Ledger Account Numbering Protocol - Six Numeric Digits (4th Segment of GL String)

Digit 1	Digit 1 + Digit 2	Digit 1 + Digit 2 + Digit 3 (+ Digit 4)	Digits 4 - 6 / Digits 5 - 6
Project Category 1	Project Category 2	Project Category 3	Number 000-999 / Number 00-99
1XX -Water	11X - Water Treatment Plants & Facilities	111 - Lake Huron	
		112 - Northeast	
		113 - Southwest	
		114 - Springwells	
		115 - Water Works Park	
		116 - General Purpose	
	12X - Field Services	121 - General Purpose	
		122 - Transmission System	
	13X - Systems Control Center	131 - General Purpose	
		132 - Pump Stations & Reservoirs	
	14X - Water Quality	141 - General Purpose	
	15X - Metering	151 - General Purpose	
	16X - General Purpose	161 - General Purpose	
	17X - Programs	1701 - Programs	
2XX - Wastewater	21X - Wastewater Resource Recovery Facility	211 - Primary Treatment	
		212 - Secondary Treatment & Disinfection	
		213 - Residuals Management	
		214 - Industrial Waste Control	
		215 - CSO RTB & SDF	
		216 - General Purpose	
	22X - Field Services	221 - General Purpose	
		222 - Interceptor	
	23X - Systems Control Center	231 - General Purpose	
		232 - Pump Stations	
		233 - In System Devices (Dams, ISD's)	
	24X - Metering	241 - General Purpose	
	25X - General Purpose	251 - General Purpose	

Digit 1	Digit 1 + Digit 2	Digit 1 + Digit 2 + Digit 3 (+ Digit 4)	Digits 4 - 6 / Digits 5 - 6
Project Category 1	Project Category 2	Project Category 3	Number 000-999 / Number 00-99
	26X - Programs	2601 - Programs	
3XX - Central Services	31X - Information Technology	311 - General Purpose	
		312 - Service Desk	
		313 - Infrastructure	
		314 - Enterprise Applications	
		315 - Business Applications	
		316 - Security	
		317 - Project Management Office	
	32X - Fleet	321 - General Purpose	
	33X - Facilities	331 - General Purpose	
	34X - Security	341 - General Purpose	
	35X - Energy Management	351 - General Purpose	
	36X - Engineering	361 - General Purpose	
	37X - General Purpose	371 - General Purpose	
	38X - Programs	3801 - Programs	

5.5. Navigation

Links have been included throughout this document to direct the reader to varying level of project details. Links to major sections are embedded within the table of contents, and CIP numbers within the master project table are consistent throughout the CIP materials, so that a digital search for the CIP number will quickly locate each mention of the project. Due to the size of the Appendices, these documents will be maintained separately from the main body text. In the front of each Appendix will be a list of projects that are contained within the Appendix. By selecting a project within this list, the reader will be directed to the BCE related to that project.

5.6. CIP and Business Unit Overview

In order to understand the full extent of the Water and Wastewater Systems under the responsibility of GLWA, sections are included to provide an overview of the services provided and infrastructure maintained within each category. While the information is not all-inclusive, it does contain a substantial amount of reference information that will help the reader familiarize themselves with the capital assets and responsibilities of each business unit. As the CIP document evolves annually, these sections will be continuously updated to provide the great source of reference material related to the GLWA infrastructure.

SECTION 6 2019 CIP CHANGES

Many new enhancements are visible in the 2019-2023 CIP. The 2019 CIP continues to improve and evolve to provide the various stakeholders accurate and timely information at their fingertips.

Modifications to the 2019 CIP generally occurred based upon two overarching strategies. These include the development of the CIP database for internal ease in BCE development and reporting, and updates based upon significant stakeholder input and recommended changes.

Major changes will be identified and many more changes, improvements and modification are in conceptual form now and will not be available for the 2019 CIP. This document, the format and content will continue to change and improve from year-to-year as the process matures.

6.1. CIP Database

Building on the improvements seen in the CIP last year, data was gathered and reports were generated based upon the development of the CIP database. The CIP database is a collaboration of information previously prepared for the prior year CIP and newly developed functionality, information and reporting abilities. The prior CIP was built based upon a combination of spreadsheets and word documents as BCE's, however this year the entire data collection effort was performed using the newly developed database. As with any new process, challenges existed and were overcome.

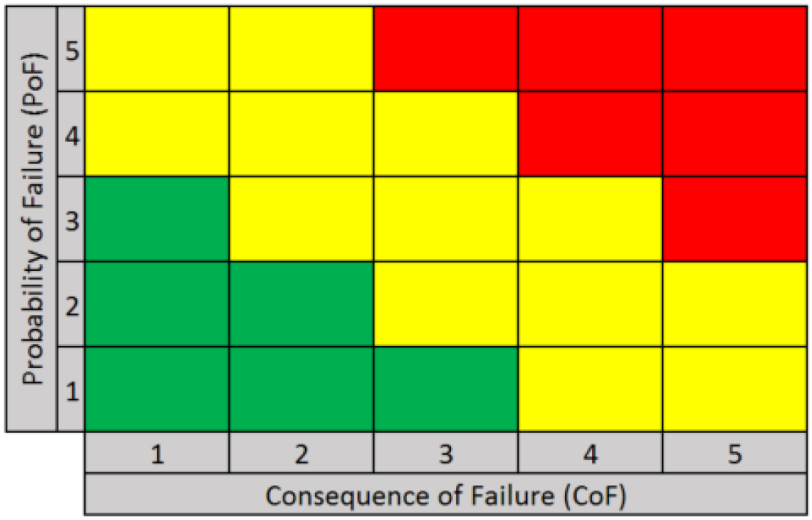
6.2. Project Risk Matrix

New to the CIP process in the 2019 - 2023 CIP is the concept of identifying projects specifically related to their Probability of Failure (PoF) and Consequence of Failure (CoF) and portraying these values on an overall Risk Matrix. The overall criteria will remain unchanged, however, in order to show each project on the risk matrix, the eight criteria used in the project prioritization framework will be designated as either a PoF or CoF primary risk driver. The designation of PoF and CoF to each criteria as primary risk driver is shown following table:

	Criteria	Primary Risk Driver
1	Condition	Probability
2	Performance (Service Level / Reliability)	Probability
3	Regulatory (Environmental/Legal)	Consequence
4	O&M	Probability
5	Public Health & Safety	Consequence
6	Public Benefit	Consequence
7	Financial	Consequence
8	Efficiency & Innovation	Consequence

After each criteria is scored for each project, the weighted PoF and CoF factors will be calculated. This will provide a 1 to 5 vertical axis value for probability of failure and a 1 to 5 horizontal axis value for the consequence of failure. This point will be plotted with the other projects to show its relative position compared to others within the matrix. A sample of the matrix is shown below.

RISK MATRIX



This provides the varying audiences additional information related to the overall project risk as it relates to its consequence and probability of failure.

6.3. Cost Estimations Classifications

New to the CIP this year, it is anticipated that a cost estimate classification rating has been included for each phase of each project that is based upon the estimates' degree of accuracy according to the level of project definition. This cost estimate rating will give the reader an idea of whether the cost estimate is a ballpark-level estimate, generally for work projected in the out years, or a higher-confidence estimate, such as for work projected to start sooner or already under contract.

GLWA has adopted the American Association of Cost Engineering (AACE) International system for classifying cost estimates. This standardized method for classifying project phases will be very beneficial in managing expectations related to the accuracy of the associated procurement contracts.

AACE Cost Estimate Classes

Estimate Class	Project Definition	End Usage	Method	Average Expected Accuracy Range	
Class 5	0% to 2%	Screening or feasibility	Judgement, trend analysis, parametric	120 %	-60%
Class 4	1% to 15%	Concept study or feasibility	More parametric, expert opinion, trend analysis	85%	-43%
Class 3	10% to 40%	Budget authorization or control	Combinations (detailed, unit cost, activity-based + class 4 & 5 methods	40%	-20%
Class 2	30% to 70%	Control or bid/tender	Primarily deterministic	20%	-10%
Class 1	50% to 100%	Check estimate or bid/tender	Deterministic	10%	-5%

6.4. Innovation, Master Plan Right-Sizing, Redundancy & NE WTP Related Projects

The development of the database and means to intake and report out on project BCE's has allowed GLWA to classify and coordinate projects based on key areas of interest. Several areas of interest

have been identified and can be seen in Chapter IV. These area are:

- Innovation: Projects that may have a possibility at utilizing an innovative solution or process.
- Master Plan Right-Sizing: Projects that have incorporated the 2015 Water Master Plan recommendations to "Right-Size" infrastructure to allow for future capital cost avoidance by derating the water supply system.
- Redundancy: Projects that have a direct impact at improving system redundancy.
- NE WTP Repurposing: Projects necessary to meet the 2015 Water Master Plan recommendations to repurpose the Northeast Water Treatment Plant to allow for future capital cost avoidance.

6.5. Program & Allowance Project "Carve Outs"

In the past, projects that were performed under an allowance or a program typically were not specifically identified within the CIP unless the project had significant expenses and schedule to warrant its addition to the CIP the following year. In the current 2018 fiscal year, Finance began issuing a CIP number and tracking these projects within the BS&A financial software. These projects have been coined, "carve outs", as they are carved out of the parent allowance or program CIP. The CIP number associated with these carve outs is numerically relevant to the parent CIP number. To better portray this relationship in the CIP, the project carve outs are rolled up as phases under the parent CIP program or allowance.

6.6. Project Year-to-Year Comparison

In order to compare project projected expenses from one year to the next, comparison tables have been included in each project summary and BCE. This also allows the reader to identify how the project schedule may have changed from year-to-year. Project Managers and Engineers description of the change is typically also included at the project level.

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			1,000	3,000	1,600				0	5,600
2019	0		251	3,919	1,187	0	0	0	0	5,357

Description of CIP Changes	moved construction start to FY2019, added GLWA costs, changed project delivery from DBB to DB

6.7. Project Phase Schedule

Another area of change that will have significant benefit for stakeholders associated with GLWA's CIP process is related to the project phase scheduling. Many projects have multiple phases and, in the past, an accurate understanding of when these project phases were scheduled was unknown. With the 2019 CIP, most project phases have been scheduled to show the high level tasks of Scope Development, Procurement, Project Execution and Project Closeout. This information will be beneficial to Procurement to determine overall procurement needs and resources, as well as, for the engineering work areas to manage project delivery. Finally, this schedule will provide the vendor community with an estimate of timing related to projects they may be interested in pursuing. Understanding that this is the first year of tracking the project phase schedules in this manner, it is anticipated that each future year will provide better and more concise information related to these schedules.

Phase Tasks and Dates

Phase Category	DB
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development	1/22/2018	100	5/2/2018
Procurement	7/1/2018	220	2/6/2019
Project Execution	2/6/2019	750	2/25/2021
Project Closeout	2/25/2021	90	5/26/2021

III. CIP FINANCIAL PLAN

SECTION 1 INTRODUCTION

The GLWA CIP financial plan balances a number of objectives to support the Authority's mission. Those objectives include the following.

- ✓ Transparency in developing the financial plan.
- ✓ Collaboration – both internally and externally.
- ✓ Ensuring sustainability through an iterative process to challenge our assumptions and seek innovative solutions.
- ✓ Reduce the debt burden by improved selection of funding source with useful lives of the asset.
- ✓ Emphasize predictability thereby smoothing out the impact on service charges.
- ✓ Improve the Authority's financial position with a measurable goal of achieving an AA rating.

The Authority draws upon five sources of funding for its CIP.

1. **Bond Proceeds**: The Authority uses an incremental method of funding long-lived capital projects through a bond financing program rather than funding all projects in advance. The Authority issues revenue bonds pursuant to Michigan Public Act 94 of 1933 (the Revenue Bond Act). The Act provides a pledge of "net revenues" for the payment of the bond principal and interest. "Net revenues" means the revenues of the system remaining after deducting the reasonable expenses of administration, operation, and maintenance of the System.
2. **Revenue Financed Capital (Improvement & Extension Fund):** Based upon ongoing expense, capital, and revenue optimization efforts, the Authority is able to build reserves to fund pay-as-you go capital for shorter-lived and lower-dollar capital expenditures. These funds are not budgeted for use until received and then recorded in the Improvement & Extension Fund for the water or the sewer system.
3. **Federal Loan Programs:** The Authority's sources of funding includes lower cost financing programs including the State Revolving Fund (SRF) Loan Program and the Drinking Water Revolving Fund (DWRF) Loan Program.
4. **Grants:** The Authority utilizes public grants programs such as Stormwater, Asset Management, and Wastewater (provides both grants and loans) and is pursuing federal and private grants for energy optimization.
5. **Contributed Capital:** Periodically, the Authority has the opportunity to optimize the System with specific customer participation. Depending on the nature of the shared financing strategy, the Authority may offset the cost of System expansion or improvements with contributed capital from that customer.

To ensure proper accountability of funding sources and uses, the Authority utilizes two funds for its capital program for each system: the Construction Bond Fund and the Improvement & Extension (I&E) Fund.

- ✓ **Construction Bond Fund:** This fund represents the proceeds of bond issuances and related interest earnings for the purposes of financing capital improvements. New with this CIP, GLWA has made a concentrated effort to implement a CIP financial plan strategy where long-lived assets, defined as constructed infrastructure and plant facilities with an estimated useful life greater than 20 years, are eligible for bond funding.
- ✓ **Improvement & Extension (I&E) Fund:** The I&E Fund is defined by the Authority's Master Bond Ordinance (MBO) as the "fund used for improvements, enlargements, extensions or betterment" of the System. Cash receipts of

The capital financial plan will be updated after further detailed project review occurs.

the Authority are transferred into the I&E Fund pursuant to a flow of funds after commitments are met for a monthly allocation of operations and maintenance expense, debt service, pension, WRAP, budget stabilization fund, and extraordinary repair and replacement fund as administered by a trustee. Capital outlay items are funded with I&E Funds. Capital outlay are items that are generally purchased (rather than constructed) and with an estimated useful life of less than 20 years.

The basis of accounting for the capital spending is the accrual basis. Under this basis of accounting, revenues are recognized when earned and measurable regardless of when collected; and expenses are recorded, or accrued, on a matching basis when incurred. Accrued expenses are expected to be paid in a subsequent accounting period. For purposes of this CIP, expenses and expenditures are used interchangeably.

SECTION 2 SUMMARY CIP FINANCIAL PLAN REVIEW AND ANALYSIS

Improvements in the CIP project *evaluation* process that resulted in this plan were followed by improvements in this year's "CIP *financial* plan" process. The new GLWA CIP financial plan document is based on a foundational database to support improved analysis and decision-making, provide a new level of transparency, balance risk and opportunity, and demonstrate greater clarity in the long-term GLWA financial strategy. This expanded approach is an evolution from financial capital planning that was previously at a macro level. With the ultimate performance measure of lowering the cost of capital for our customers, a better-executed financial plan optimizes the use of bonds, revenue financial capital, revolving fund loans, and grants. It also contemplates execution risk (actual rate of capital project delivery) versus inherent risk in project cost estimating. Lastly a sustainable financial plan encompasses flexibility to allow for strategic timing of new debt, pace of cash flow needs, and adequate reserves for system needs.

While the GLWA Board of Directors approves the plan, the authority to spend does not occur until additional project review processes are completed prior to the procurement process. Depending on the scope and dollar amount of the project, final approval to proceed may include customer engagement, Chief Executive Officer review, and GLWA Board CIP Committee review and/or GLWA Board action.

2.1. Cost Allocation to Customer Charges

Revenue requirements are the basis for establishing customer charges. Included in that calculation are operations and maintenance expense, debt service, Master Bond Ordinance (MBO) reserve requirements, system lease requirements, revenue financed capital targets, water residential assistance program commitments, and legacy obligations. The cost of capital improvements is allocated to customers among four general cost pools as described below.

1. Common-to-All (CTA) represents costs that are allocable to all customers.
2. Suburban Only represents costs that are allocable to those defined as suburban (i.e. excluding the City of Detroit customers).
3. CSO 83/17 represents capital costs that are allocated based upon terms of a 1999 rate settlement agreement sanctioned by a federal court. The outcome was an allocation of 83% of "combined sewer overflow control facilities" (CSO) costs to City of Detroit customers and 17% to other customers.
4. Industrial Waste Control Facilities (IWC) provide for the pretreatment of industrial wastewater.

As shown in Table III-1 below, many the proposed capital improvements are allocated to the common-to-all cost pool.

The capital financial plan will be updated after further detailed project review occurs.

Table III-1. Cost Allocation

Cost Allocation	Projected Capital Expenditures FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Total FYs 2019-2023	Percent of Five Year Total
Water							
Common-to-all							
Suburban Only							
Grand Total							

Sample Tables & Charts

Cost Allocation	Projected Capital Expenditures FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Total FYs 2019-2023	Percent of Five Year Total
Wastewater							
Common-to-all							
OMID							
CSO 83/17							
Industrial Waste Control							
Suburban Only							
Grand Total							

2.2. CIP Funding Based on Estimated Useful Life

As a new entity, GLWA is evaluating and establishing financial policies to advance financial sustainability. With the FY 2019-2023 CIP document, an effort was made to differentiate between appropriate uses of long-term debt versus revenue financed capital received and recorded to date in the Improvement & Extension (I&E) Fund as defined in the MBO. While GLWA is positioning itself to further reduce reliance on outstanding debt, the financial plan related to this CIP anticipates further debt issuances. For this reason, the five-year financial plan is regularly reviewed during the fiscal year. Updates may occur due to changes in revenue sources, grant awards, approval of lower interest rate revolving fund debt, and other budgetary conditions. The financial plan reflects grants and federal and state loans only after approval is received by the grantor or authorizing party.

As shown in Table III-2, most of the CIP projects are longer lived assets, defined as greater than a 20-year estimated useful life.

The capital financial plan will be updated after further detailed project review occurs.

Table III-2. Asset Life and Eligibility for Funding with Long-Term Debt

Asset Life Range	Projected Capital Expenditures FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Total FYs 2019-2023	Percent of Five Year Total
Water							
<20 years							
>20 years							
Grand Total							

Sample Tables & Charts

Asset Life Range	Projected Capital Expenditures FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Total FYs 2019-2023	Percent of Five Year Total
Wastewater							
<20 years							
>20 years							
Grand Total							

2.3. Project Status Analysis

As shown in Table III-3, 76.8% of the water system projects and 59.7% of the wastewater system projects are classified as "Not Yet Started". As defined in Chapter I, a Project Status of "Not Yet Started" are projects that have been included in the previous CIP, have never had expenditures charged to it, and does not have an assigned BS&A Project Number. The high percentage of not yet started has not been unusual because the staff is responsible for identifying and prioritizing system needs without the benefit of a more refined prioritization process. This is not unlike other public utilities. The outcome, however, is that this inherently may result in a CIP that identifies more projects than there are organizational resources to manage. Additionally, it is not uncommon for operational needs to curtail CIP execution.

With this new plan year, GLWA continues improvement in the CIP process reinvented in the 2018-2022 CIP cycle. In FY 2016, GLWA began staffing its Systems Planning area. As this role continues to mature, the CIP will become more refined to better align priorities and resources. That Asset Management & CIP team launched a wastewater master plan process in 2017, which will further inform the ongoing capital planning efforts at GLWA.

The capital financial plan will be updated after further detailed project review occurs.

Table III-3. Project Status Analysis

Project Status	Number of Projects beginning of FY 2019	Projected Capital Expenditures FY 2019	Status as % of Capital Expenditures FY 2019	Projected Capital Expenditures FY 2020	FY 2021	FY 2022	FY 2023	Total FYs 2019-2023
Water								
Active								
New								
Future Planned								
Cancelled								
Pending Closeout								
Closed								
Reclassified								
Grand Total								

Sample Tables & Charts

Project Status	Number of Projects beginning of FY 2019	Projected Capital Expenditures FY 2019	Status as % of Capital Expenditures FY 2019	Projected Capital Expenditures FY 2020	FY 2021	FY 2022	FY 2023	Total FYs 2019-2023
Wastewater								
Active								
New								
Future Planned								
Cancelled								
Pending Closeout								
Closed								
Reclassified								
Grand Total								

The capital financial plan will be updated after further detailed project review occurs.

2.4. Project Category Analysis

As noted in Chapter I, Section 4.2 on page II-5, project phase categories relate to how a project will be delivered and managed. Categories may be grouped to align with how the work is to be performed and often with one vendor contract. The current project categories are identified below.

S.....Study
D.....Design
C .....Construction
CA .....Construction Assistance
DB.....Design and Build
DBA.....Design Build Assistance
CM.....Construction Management
IA.....Intergovernmental Agreement*
PO .....Purchase Order
PM .....Project Management

The project categories inform the financial planning process. In this case, having a relatively high percentage of projects that are Not Yet Started (Table III-3) compared with the Project Category Analysis (Table III-4) that has a high dollar amount in construction categories indicates that it may be challenging to deliver the CIP as presented. Again, this is not necessarily unusual in a large utility. Our goal with improving processes and building staff capacity is to narrow those ratios. When it comes to evaluating the CIP financial plan, the existence of a number of high dollar, long lead time projects that have not started, indicates a reduced need to borrow and/or shift the allocation of financial resources.

As in the 2018-2022 CIP, few "as needed" contracts and allowances are found in the 2019-2023 CIP. Those types of costs are included in a combination of other areas in the financial plan such as the Improvement & Extension Fund as capital outlay items. Thus, the proposed CIP is limited to clearly defined project categories.

2.5. Total CIP Requests Compared to the Financial Plan

The CIP Financial Plan reduces the rate of capital project delivery, the nature of projects in the CIP, funding source opportunities, and improving financial metrics. In FY 2017, based on projected estimates and preliminary, unaudited financial information, the rate of CIP spend for the water system is at 61% and at 47% for the wastewater system. Given that staff effort has been directed toward stand-up of the GLWA in 2016, and the evaluation of the water system master plan adopted in 2016, it is expected that the rate of capital spend will increase over the next twelve months. Table III-5 below summarizes the requested CIP expenditures and adjusts for an estimated rate of actual capital spend. For GLWA, the financing plan applies a rate of 80% to each project, unless there is an external committed funding source (such as SRF/DWRF). In that instance, 100% of the amount is included in the CIP Financial plan.

Table III-5 provides the total CIP requests at 100% versus the amount funded in the in the financial plan.

The capital financial plan will be updated after further detailed project review occurs.

Table III-4. Project Category Analysis

Phase Status	Number of Project Phases beginning of FY 2019	Projected Capital Expenditures FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Total FYs 2019-2023	Category as a Percent of Total FYs 2019-2023
Water									
C									
CA									
CM									
D									
D/C									
D/CA									
D/CA/C									
DB									
PM									
PO									
S									
S/D/C									
S/D/CA									
S/D/CA/C									
S/D/CM									
DBA									
TBD									
Grand Total									

Sample Tables & Charts

The capital financial plan will be updated after further detailed project review occurs.

Phase Status	Number of Project Phases beginning of FY 2019	Projected Capital Expenditures FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Total FYs 2019-2023	Category as a Percent of Total FYs 2019-2023
Wastewater									
C									
CA									
CM									
D									
D/C									
D/CA									
D/CA/C									
DB									
PM									
PO									
S									
S/D/C									
S/D/CA									
S/D/CA/C									
S/D/CM									
DBA									
TBD									
Grand Total									

Sample Tables & Charts

The capital financial plan will be updated after further detailed project review occurs.

Table III-5. Total CIP Requests vs Financing Plan

System Allocation	Projected Capital Expenditures FY 2017	Projected Capital Expenditures FY 2018	Projected Capital Expenditures FY 2019	Projected Capital Expenditures FY 2020	Projected Capital Expenditures FY 2021	Projected Capital Expenditures FY 2022	Total Projected Expenditures FYs 2018-2022
Water							
Total CIP Requests @ 100%	$ 139,469	$ 137,655	$ 194,089	$ 197,259	$ 141,305	$ 130,300	$ 800,608
Financial Plan	$ 139,469	$ 110,124	$ 155,271	$ 157,807	$ 113,	104,240	$ 640,487
Effective Rate	100%	80%	80%	80%			80%

Sample Tables & Charts

System Allocation	Projected Capital Expenditures FY 2017	Projected Capital Expenditures FY 2018	Projected Capital Expenditures FY 2019	Projected Capital Expenditures FY 2020	Projected Capital Expenditures FY 2021	Projected Capital Expenditures FY 2022	Projected Expenditures FYs 2018-2022
Wastewater							
Total CIP Requests @ 100%	$ 60,388	$ 160,746	$ 197,493	$ 189,794	$ 115,442	$ 89,250	$ 752,725
Financial Plan	$ 52,435	$ 139,176	$ 167,941	$ 156,933	$ 92,354	$ 71,400	$ 627,804
Effective Rate	87%	87%	85%	83%	80%	80%	83%

Capital Project Expenditures are included in the financing plan at 80%, except for SRF Loan Projects which are included at 100%.

2.6. CIP Financial Plan

The CIP financial plan is shown in Table III-6. The focus is on the sources and uses of funds for capital spending.

In summary, this CIP financial plan demonstrates the following principles applied in its development.

1. Anticipates bond issuance for CIP for projects with an estimated useful life greater than 20 years
2. Includes only state revolving fund loans and grants that are approved and authorized
3. Includes transfers from the I&E Funds limited to funds received to date
4. I&E Funds limited to CIP requests with an estimated useful life less than 20 years
5. The use of I&E Funds will continue to be evaluated to reduce future debt issuances
6. Contributed capital is identified as a future source to accommodate new customers and/or other intergovernmental agreements
7. Expenditures are adjusted for a projected rate of capital delivery rather than the sum of CIP requests.

The capital financial plan will be updated after further detailed project review occurs.

Table III-6. CIP Financial Plan - Sources and Uses of Capital Spending

CIP Funding Sources and Uses	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	Five Year Total	% of Total
Water System Bond Construction Fund								
Beginning Balance (unaudited)	$ 5,000	$ 173,953	$ 109,200	$ 184,614	$ 69,081	$ 100,711	$ 173,953	24.9%
Bond Proceeds, net	225,883	-	188,000	-	94,000	-	282,000	40.4%
Investment Income	577	435	743	462	408	252	2,299	0.3%
DWRF Loan Reimbursements	-	-	-	-	-	-	-	0.0%
Transfers from I&E Fund - Specific (a)	3,258	14,936	6,942	1,813	266	-	23,957	3.4%
Transfers from I&E Fund - Strategic (b)	2,500	30,000	35,000	40,000	50,000	60,000	215,000	30.8%
Grants	-	-	-	-	-	-	-	0.0%
Contributed Capital Sources	-	-	-	-	-	-	-	0.0%
Subtotal - Sources	237,219	219,324	339,885	226,888	213,755	160,963	697,209	100.0%
Capital Project Expenditures (c)	(63,265)	(110,124)	(155,271)	(157,807)	(113,044)	(104,240)	(640,487)	
Projected Ending Balance	$ 173,953	$ 109,200	$ 184,614	$ 69,081	$ 100,711	$ 56,723	$ 56,723	

CIP Funding Sources and Uses	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	Five Year Total	% of Total
Sewer System Bond Construction Fund								
Beginning Balance (unaudited)	$ 100,000	$ 75,143	$ 119,550	$ 22,664	$ 144,433	$ 77,440	$ 75,143	11.4%
Bond Proceeds, net	-	96,500	-	230,500	-	-	327,000	49.6%
Investment Income	250	429	299	633	361	194	1,916	0.3%
SRF Loan Reimbursements	20,621	52,897	49,732	25,488	-	-	128,117	19.4%
Transfers from I&E Fund - Specific (a)	1,706	3,758	1,024	2,080	5,000	5,000	16,862	2.6%
Transfers from I&E Fund - Strategic (b)	5,000	30,000	20,000	20,000	20,000	20,000	110,000	16.7%
Grants	-	-	-	-	-	-	-	0.0%
Contributed Capital Sources	-	-	-	-	-	-	-	0.0%
Subtotal - Sources	127,577	258,727	190,605	301,365	169,794	102,634	659,037	100.0%
Capital Project Expenditures (c)	(52,435)	(139,176)	(167,941)	(156,933)	(92,354)	(71,400)	(627,803)	
Projected Ending Balance	$ 75,143	$ 119,550	$ 22,664	$ 144,433	$ 77,440	$ 31,234	$ 31,234	

(a) Expenditures on projects for studies and short lived projects that may not considered "debt eligible".

(b) Strategic use of revenue financed capital on "debt eligible" projects to transform away from reliance on debt financing.

(c) Capital Project Expenditures are included in the financing plan at 80% of the Requested Expenditures, except for SRF Loan Projects which are included at 100%.

The capital financial plan will be updated after further detailed project review occurs.

IV. CIP SUMMARY

SECTION 1 HIGHLIGHTS

1.1. Possible Innovative Projects

One of the Great Lakes Water Authority's main pillars is to provide high quality through innovation. In order to ensure CIP projects are being considered for new and innovative technologies, during the project review process, projects that may be considered for innovative technologies, practices or procedures were identified by the GLWA Energy, Research & Innovation group. The following projects will be further evaluated for innovative opportunities during scope development process:

Table IV-1. Innovation Projects

CIP	Title
111001	LH WTP Low Lift Pumping, Filter Backwash Pumps & Flocculation Improvements
170600	Water Transmission Main Asset Assessment Program
211006	WRRF PS No. 1 Improvements
211007	WRRF PS #2 Bar Racks Replacements and Grit Collection System Improvements
211008	WRRF Rehabilitation of Ferric Chloride Feed System in PS-1 and Complex B Sludge Lines
211009	WRRF Rehabilitation of the Circular Primary Clarifier Scum Removal System
212004	WRRF Chlorination and Dechlorination Process Equipment Improvements
212008	WRRF Rehabilitation of Intermediate Lift Pumps (ILPs)
213005	WRRF Complex I Incinerators Decommissioning and Reusability
213008	WRRF Rehabilitation of the Ash Handling Systems
216004	Rehabilitation of Various Sampling Sites and PS#2 Ferric Chloride System at WRRF
216006	Rehabilitation of Potable Water, Screened Final Effluent (SFE), Natural Gas, Secondary Water System and Compressed Air Pipelines & SFE Pump Station
222003	North Interceptor East Arm (NIEA) Evaluation and Rehabilitation
222007	NIEA Evaluation and Rehabilitation from WRRF to Gratiot Ave. and Sylvester St.
232003	Northeast Pumping Station
233002	Collection System In System Storage Devices (ISDs) Improvement
251002	Wastewater System-Wide Instrumentation & Control Software and Hardware Upgrade
331001	Roofing Systems Replacement at Water Plants and Booster Pump Stations
331002	Roofing Systems Replacement at GLWA WRRF, CSO Retention Treatment Basins (RTB) and Screening Disinfection Facilities (SDF)

1.2. Master Plan Right-Sizing Projects

Based upon the recent completion and acceptance of the Comprehensive Water Master Plan, many water projects are being considered with reduced capital investment in order to reduce the rated capacity to master plan identified levels based upon current population and water usage. The following projects have capital expenditure avoidance based upon water master planning efforts to right-sizing the system for current needs:

Table IV-2 . Master Plan Right-Sizing Projects

CIP	Title
111001	LH WTP Low Lift Pumping, Filter Backwash Pumps & Flocculation Improvements
113002	SW WTP High Lift Pump Discharge Valve Actuators Replacement
113003	SW WTP Low and High Lift Pumping & Rapid Mix Chamber BFVs, Sluice Gates, Flocculation & Filtration System Improvements

CIP	Title
114002	SPW WTP Low Lift and High Lift Pump Station
114009	SPW WTP Service Area Redundancy Study
114013	SPW WTP Reservoir Fill Line Improvements
116004	WTP Right-Sizing Implementation Plan
122003	Waterworks Park WTP to Northeast WTP Transmission Main
122007	Hannon Road Transmission Main
122014	Romulus 48-inch Water Main Installation

1.3. Redundancy Projects

Finally, redundancy in the transmission system is of high importance to GLWA. The following projects will enhance the redundancy within the water transmission system:

Table IV-3 . Redundancy Projects

CIP	Title
111001	LH WTP Low Lift Pumping, Filter Backwash Pumps & Flocculation Improvements
114009	SPW WTP Service Area Redundancy Study
114013	SPW WTP Reservoir Fill Line Improvements
116004	WTP Right-Sizing Implementation Plan
122001	Parallel 42-Inch Main in 24 Mile Road from Rochester Station to Romeo Plank Road
122003	Waterworks Park WTP to Northeast WTP Transmission Main
122004	96-inch Main Relocation, Isolation Valves Installations, and New Parallel Main
122005	Transmission System Water Main Work - Replacement of Schoolcraft Water Main
122006	Transmission System Water Main Work-Wick Road Parallel Water Main
122007	Hannon Road Transmission Main
122009	Water System Improvements in Joy Road from Southfield Road to Trinity
122010	Water Main Replacement within the City of Detroit - Joy Rd from Greenfield to Schaefer and Davison Ave from Lindwood to Livernois
122011	Park-Merriman Water Main-Final Phase
122012	36-inch Water Main in Telegraph Road
122013	14 Mile Transmission Main Loop
122014	Romulus 48-inch Water Main Installation
122015	30" Water main Replacement - Water main Replacement Under Jefferson & Rouge River
122016	Downriver Transmission Main Loop
132003	West Service Center PS - Isolation Gate Valves for Line Pumps
170400	Water Transmission Improvement Program
170500	Transmission System Valve Assessment and Rehabilitation/Replacement

1.4. Northeast Water Treatment Plant Repurposing Related Projects

The 2015 Comprehensive Water Master Plan has identified the ability to reduce the number of water treatment facilities in full operation at GLWA. Initially, for long-term capital expenditure avoidance, the plan has identified the repurposing of the Northeast Water Treatment Plant. In order to repurpose this facility into a reservoir and pump station, several capital projects are necessary to achieve the savings identified in the master plan. The following projects are associated with the repurposing of the Northeast Water Treatment Plant:

CIP	Title
114013	SPW WTP Reservoir Fill Line Improvements
115001	WWP WTP Yard Piping, Valves and Venturi Meters Replacement
116002	Pennsylvania, Springwells and Northeast Raw Water Supply Tunnel Improvements
122003	Waterworks Park WTP to Northeast WTP Transmission Main
132010	West Service Center PS - Duval Rd Division Valve Upgrades

SECTION 2 5-YEAR CIP SUMMARY TABLES

The Great Lakes Water Authority 2019-2023 Capital Improvement Plan overall summary tables can be seen below. All financial figures are in thousands of dollars ($1,000's).

Table IV-4. Water CIP Categories

Category	Category Number	Lifetime Actual Thru FY 2017 (Unaudited)	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond	2019-2023 CIP Total	Project Total
Water											
Treatment Plants & Facilities											
Lake Huron	111	$ 1,326	$ 3,387	$ 18,432	$ 23,900	$ 5,744	$ 10,350	$ 20,075	$ 19,575	$ 78,501	$ 102,789
Northeast	112	163	293	2,175	5,596	15,750	15,750	15,750	14,550	55,021	70,027
Southwest	113	297	397	7,210	7,267	6,222	17,675	25,190	140,306	63,564	204,564
Springwells	114	84,336	14,138	19,913	14,125	14,333	9,125	19,525	240,163	77,021	415,658
Water Works Park	115	2,331	3,277	11,003	25,150	25,140	-	-	-	61,293	66,901
General Purpose	116	10	8,834	16,251	20,224	379	-	-	-	36,854	45,698
Treatment Plants & Facilities Total		**88,463**	**30,326**	**74,984**	**96,262**	**67,568**	**52,900**	**80,540**	**414,594**	**372,254**	**905,637**
Field Services											
General Purpose	121	-	-	-	-	-	-	-	-	-	-
Transmission System	122	49,187	10,788	21,036	49,606	83,887	111,449	102,918	29,230	368,896	458,101
Field Services Total		**49,187**	**10,788**	**21,036**	**49,606**	**83,887**	**111,449**	**102,918**	**29,230**	**368,896**	**458,101**
SCC											
General Purpose	131	-	-	-	-	-	-	-	-	-	-
Pump Station/Reservoir	132	861	2,973	8,732	15,465	15,340	14,150	3,975	1,925	57,662	63,421
SCC Total		**861**	**2,973**	**8,732**	**15,465**	**15,340**	**14,150**	**3,975**	**1,925**	**57,662**	**63,421**
Water Quality											
General Purpose	141	-	-	-	-	-	-	-	-	-	-
Water Quality Total		-	-	-	-	-	-	-	-	-	-
Metering											
General Purpose	151	-	-	-	-	-	-	-	-	-	-
Metering Total		-	-	-	-	-	-	-	-	-	-
General Purpose											
General Purpose	161	330	-	-	-	-	-	-	-	-	330
General Purpose Total		**330**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**330**
Programs											
Programs	17X	20,779	26,027	33,760	34,672	33,822	35,947	35,947	3,768	174,148	224,722
Programs Total		**20,779**	**26,027**	**33,760**	**34,672**	**33,822**	**35,947**	**35,947**	**3,768**	**174,148**	**224,722**
Water Total		**159,620**	**70,114**	**138,512**	**196,005**	**200,617**	**214,446**	**223,380**	**449,517**	**972,960**	**1,652,211**
Water Central Services											

Category	Category Number	Lifetime Actual Thru FY 2017 (Unaudited)	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond	2019-2023 CIP Total	Project Total
Information Technology	31X	-	-	-	-	-	-	-	-	-	-
Fleet	32X	-	-	-	-	-	-	-	-	-	-
Facilities	33X	-	3,060	2,060	2,060	-	-	-	-	4,120	7,180
Security	34X	-	-	-	-	-	-	-	-	-	-
Energy Management	35X	-	2,774	-	-	-	-	-	-	-	2,774
Engineering	36X	630	-	-	-	-	-	-	-	-	630
General Purpose	37X	-	-	-	-	-	-	-	-	-	-
Programs	38XX	460	1,538	2,131	1,866	1,866	500	500	-	6,863	8,861
Water Central Services Total		1,090	7,372	4,191	3,926	1,866	500	500	-	10,983	19,445
Grand Total		$160,710	$77,486	$142,703	$199,931	$202,483	$214,946	$223,880	$449,517	$983,943	$1,671,656

Table IV-5. Wastewater CIP Categories.

Category	Category Number	Lifetime Actual Thru FY 2017 (Unaudited)	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond	2019-2023 CIP Total	Project Total
Wastewater											
WRRF											
Primary Treatment	211	$32,998	$18,543	$30,426	$16,387	$24,286	$30,637	$18,231	$7,695	$119,967	$179,203
Secondary Treatment & Disinfection	212	55,925	32,666	25,216	4,356	7,650	9,105	14,511	19,909	60,838	169,338
Residuals Management	213	89,534	8,999	17,514	11,317	5,713	6,954	9,209	10,124	50,707	159,364
IWC	214	182	-	5,767	6,540	-	-	-	-	12,307	12,489
CSO RTB & SDF	215	-	-	-	-	-	-	-	-	-	-
General Purpose	216	32,813	4,120	7,040	5,420	4,455	7,521	20,329	36,465	44,765	118,163
WRRF Total		**211,452**	**64,328**	**85,963**	**44,020**	**42,104**	**54,217**	**62,280**	**74,193**	**288,584**	**638,557**
Field Services											
General Purpose	221	-	-	-	-	-	-	-	-	-	-
Interceptors	222	5	2,563	31,151	39,779	22,669	11,500	-	-	105,099	107,667
Field Services Total		**5**	**2,563**	**31,151**	**39,779**	**22,669**	**11,500**	**-**	**-**	**105,099**	**107,667**
SCC											
General Purpose	231	-	-	-	-	-	-	-	-	-	-
Pumping Stations	232	2,879	6,086	20,082	33,627	17,220	-	-	-	70,929	79,894
In System Devices	233	-	83	446	1,991	996	-	-	-	3,433	3,516

Category	Category Number	Lifetime Actual Thru FY 2017 (Unaudited)	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond	2019-2023 CIP Total	Project Total
SCC Total		**2,879**	**6,169**	**20,528**	**35,618**	**18,216**	**-**	**-**	**-**	**74,362**	**83,410**
Metering											
General Purpose	241	-	-	-	-	-	-	-	-	-	-
Metering Total		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
General Purpose											
General Purpose	251	-	-	842	2,557	6,760	3,380	-	-	13,539	13,539
General Purpose Total		**-**	**-**	**842**	**2,557**	**6,760**	**3,380**	**-**	**-**	**13,539**	**13,539**
Programs											
Programs	26XX	18,975	27,749	50,763	59,228	62,439	70,081	42,423	3,450	284,934	335,108
Programs Total		**18,975**	**27,749**	**50,763**	**59,228**	**62,439**	**70,081**	**42,423**	**3,450**	**284,934**	**335,108**
Wastewater Total		**233,311**	**100,809**	**189,247**	**181,202**	**152,188**	**139,178**	**104,703**	**77,643**	**766,518**	**1,178,281**
Wastewater Central Services											
Information Technology	31X	-	-	-	-	-	-	-	-	-	-
Fleet	32X	-	-	-	-	-	-	-	-	-	-
Facilities	33X	-	-	275	505	5,375	5,110	-	-	11,265	11,265
Security	34X	-	-	-	-	-	-	-	-	-	-
Energy Management	35X	-	-	-	-	-	-	-	-	-	-
Engineering	36X	1,043	-	-	-	-	-	-	-	-	1,043
General Purpose	37X	-	-	-	-	-	-	-	-	-	-
Programs	38XX	475	1,580	2,344	1,849	1,303	500	500	-	6,496	8,551
Central Services Total		**1,518**	**1,580**	**2,619**	**2,354**	**6,678**	**5,610**	**500**	**-**	**17,761**	**20,859**
Grand Total		$234,829	$102,389	$191,866	$183,556	$158,866	$144,788	$105,203	$77,643	$784,279	$1,199,140

Table IV-6. Centralized Services Categories (these project categories also appear in Water and Wastewater tables)

Category	Category Number	Lifetime Actual Thru FY 2017 (Unaudited)	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond	2019-2023 CIP Total	Project Total
Information Technology	31X										
Water		$-	$-	$-	$-	$-	$-	$-	$-	$-	$-
Wastewater		-	-	-	-	-	-	-	-	-	-
Information Technology Total		-	-	-	-	-	-	-	-	-	-

Category	Category Number	Lifetime Actual Thru FY 2017 (Unaudited)	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond	2019-2023 CIP Total	Project Total
Fleet	32X										
Water		-	-	-	-	-	-	-	-	-	-
Wastewater		-	-	-	-	-	-	-	-	-	-
Fleet Total		-	-	-	-	-	-	-	-	-	-
Facilities	33X										
Water		-	3,060	2,060	2,060	-	-	-	-	4,120	7,180
Wastewater		-	-	275	505	5,375	5,110	-	-	11,265	11,265
Facilities Total		-	3,060	2,335	2,565	5,375	5,110	-	-	15,385	18,445
Security	34X										
Water		-	-	-	-	-	-	-	-	-	-
Wastewater		-	-	-	-	-	-	-	-	-	-
Security Total		-	-	-	-	-	-	-	-	-	-
Energy Management	35X										
Water		-	2,774	-	-	-	-	-	-	-	2,774
Wastewater		-	-	-	-	-	-	-	-	-	-
Energy Management Total		-	2,774	-	-	-	-	-	-	-	2,774
Engineering	36X										
Water		630	-	-	-	-	-	-	-	-	630
Wastewater		1,043	-	-	-	-	-	-	-	-	1,043
Engineering Total		1,673	-	-	-	-	-	-	-	-	1,673
General Purpose	37X										
Water		-	-	-	-	-	-	-	-	-	-
Wastewater		-	-	-	-	-	-	-	-	-	-
General Purpose Total		-	-	-	-	-	-	-	-	-	-
Programs	38XX										
Water		668	1,538	2,131	1,866	1,866	500	500	-	6,863	9,069
Wastewater		672	1,580	2,344	1,849	1,303	500	500	-	6,496	8,748
General Purpose Total		1,340	3,118	4,475	3,715	3,169	1,000	1,000	-	13,359	17,817
Grand Total		3,013	8,952	6,810	6,280	8,544	6,110	1,000	-	28,744	40,709

V. PROJECT PRIORITIZATION AND RISK EVALUATION

New and Not Yet Started water and wastewater projects were prioritized based upon eight criteria. The criteria and their weighting factors are identified in Table V-1.

Figure I-1and Figure I-2 display the distribution of project risk in terms of Probability and Consequence. For the Probability of Failure coordinate on the plot, an equally weighted average was taken of the scores for the Condition, Performance, and O&M criteria. For the Consequence of Failure coordinate, the Regulatory, Public Health & Safety, Public Benefit, Financial, and Efficiency & Innovation criteria were averaged. These plots provide the reader a better understanding of which function (probability or consequence of failure) of the overall risk is driving the need for the project.

In addition, the following pages provide the detailed prioritization of each project compared to one another along with the individual score by Project Manager and by the Review Committee.

Table V-1. Project Prioritization

No.	Weight	Criteria	Risk Factor
1	12%	Condition	Probability
2	15%	Performance (Service Level/Reliability)	Probability
3	18%	Regulatory (Environmental/Legal)	Consequence
4	11%	O&M	Probability
5	17%	Public Health & Safety	Consequence
6	8%	Public Benefit	Consequence
7	10%	Financial	Consequence
8	9%	Efficiency & Innovation	Consequence

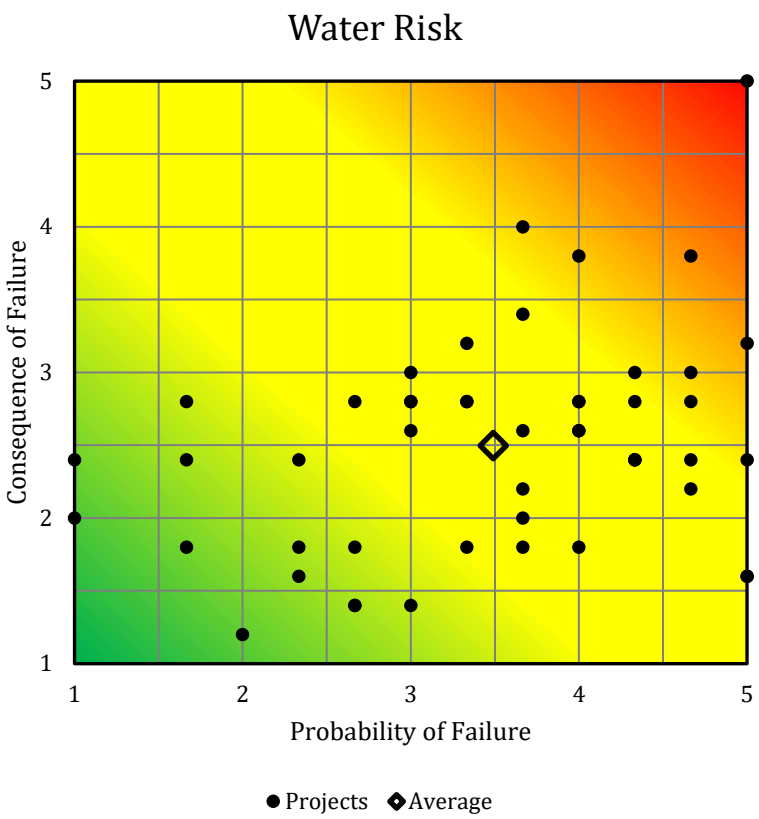


Figure I-1. Water Project Risk Scores

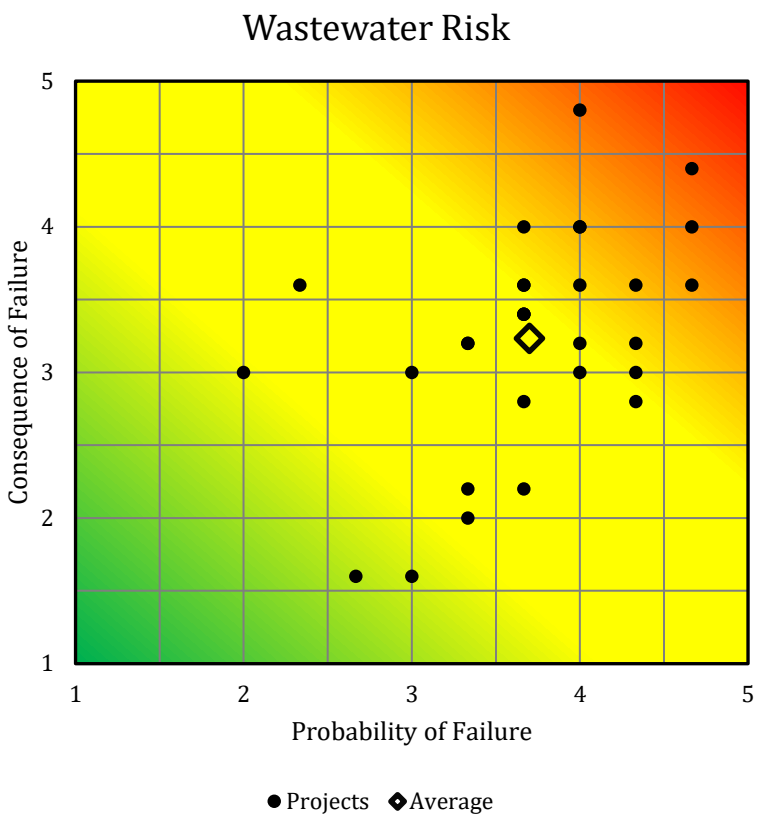
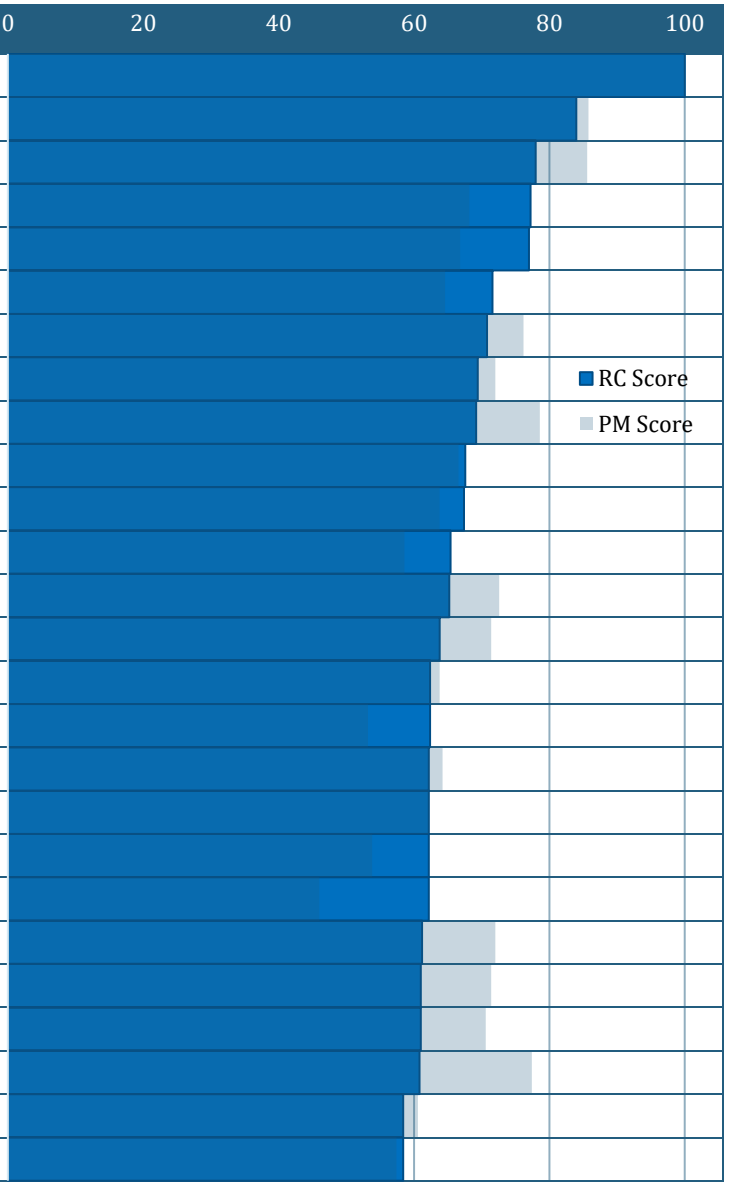


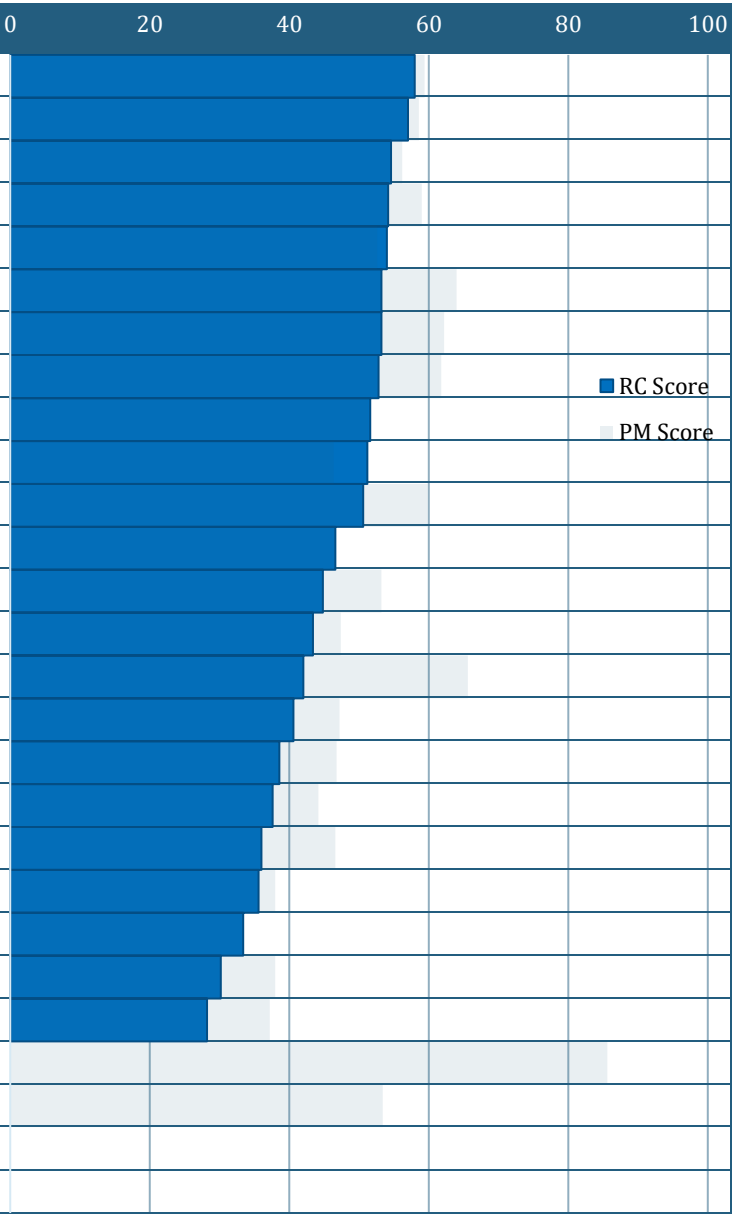
Figure I-2. Wastewater Project Risk Scores

SECTION 1 PROJECT MANAGER CRITERIA SCORES: WATER

Rank	CIP No.	Title	
1	114015	SPW WTP Emergency Grating Replacement	114015
2	115004	WWP WTP Chlorine System Upgrade	115004
3	114009	SPW WTP Service Area Redundancy Study	114009
4	114013	SPW WTP Reservoir Fill Line Improvements	114013
5	111002	LH WTP Miscellaneous Mechanical Improvements	111002
6	111001	LH WTP Low Lift Pumping, Filter Backwash Pumps…	111001
7	132003	West Service Center PS - Isolation Gate Valves for Line Pumps	132003
8	114006	SPW WTP Replacement of Rapid Mix Units 1958 Process Train	114006
9	114002	SPW WTP Low Lift and High Lift Pump Station	114002
10	113003	SW WTP Low and High Lift Pumping & Rapid Mix Chamber BFVs…	113003
11	114005	SPW WTP Administration Building Improvements & Underground…	114005
12	115001	WWP WTP Yard Piping, Valves and Venturi Meters Replacement	115001
13	122004	96-inch Main Relocation, Isolation Valves Installations…	122004
14	114007	SPW WTP Powdered Activated Carbon System Improvements	114007
15	114011	SPW WTP Steam, Condensate Return, and Compressed Air…	114011
16	122003	Waterworks Park WTP to Northeast WTP Transmission Main	122003
17	111006	LH WTP Replacement of Filter Instrumentation and Raw Water…	111006
18	114001	SPW WTP 1958 Filter Rehabilitation and Auxiliary Facilities	114001
19	114010	SPW WTP Yard Piping and High Lift Header Improvements	114010
20	112001	NE WTP Yard Piping Replacement (State Fair Valve Rehab)	112001
21	132012	Ypsilanti PS Improvements	132012
22	331001	Roofing Systems Replacement at Water Plants and Booster…	331001
23	114012	SPW WTP Water Treatment Plant 1930 Filter Building-Roof…	114012
24	351001	Water Facility Lighting Renovations	351001
25	122013	14 Mile Transmission Main Loop	122013
26	122016	Downriver Transmission Main Loop	122016



Rank	CIP No.	Title	
27	113005	SW WTP Residuals Management	113005
28	122007	Hannon Road Transmission Main	122007
29	116003	Genesee and Lapeer County Transmission…	116003
30	122006	Transmission System Water Main Work-Wick Road…	122006
31	132010	West Service Center PS - Duval Rd Division Valve Upgrades	132010
32	113002	SW WTP High Lift Pump Discharge Valve Actuators Replacement	113002
33	111007	LH WTP Raw Sludge Clarifier and Raw Sludge Pumping…	111007
34	114008	SPW WTP 1930 Sedimentation Basin Sluice Gates, Guides…	114008
35	112002	NE WTP Low Lift Pumping Plant Caisson Rehabilitation	112002
36	132008	Various PS's - Needs Assessment Study	132008
37	114003	WTP Water Production Flow Metering Improvements at NE, SW…	114003
38	113006	SW WTP Chlorine Scrubber, Raw Water Screens & Related…	113006
39	113004	SW WTP Raw Water Sampling Modifications	113004
40	132006	Ford Road PS - Pressure and Control Improvements	132006
41	122005	Transmission System Water Main Work - Replacement of Schoolcraft…	122005
42	111008	LH WTP Architectural Programming - Laboratory and Admin Building…	111008
43	111004	LH WTP Electrical Tunnel Rehabilitation	111004
44	132007	Imlay PS - Energy Management: Freeze Protection Pump Installation	132007
45	113007	SW WTP Architectural and Building Mechanical Improvements	113007
46	115003	WWP WTP Comprehensive Condition Assessment	115003
47	116004	WTP Right-Sizing Implementation Plan	116004
48	122011	Park-Merriman Water Main-Final Phase	122011
49	132004	North Service Center PS - Hydraulic Surge Control	132004
50	116002	Pennsylvania, Springwells and Northeast Raw Water Supply Tunnel…	116002
51	112003	NE WTP High-Lift Pumping Station Electrical Improvements	112003
52	122010	Water Main Replacement within the City of Detroit - Joy Rd…	122010
53	132011	West Service Center - Energy Management: VFD Installation	132011



SECTION 2 PROJECT MANAGER CRITERIA SCORES: WATER

Rank	CIP No.	Title	1	2	3	4	5	6	7	8	PM Score	1	2	3	4	5	6	7	8	Modifier	RC Score
1	114015	SPW WTP Emergency Grating Replacement	5	5	5	5	5	5	5	5	100	5	5	5	5	5	5	5	5		100.0
2	115004	WWP WTP Chlorine System Upgrade	5	5	3	5	4	5	5	3	85.8	5	4	4	5	5	5	3	2		84.0
3	114009	SPW WTP Service Area Redundancy Study	5	5	3	5	5	5	5	1	85.6	4	4	3	4	5	5	5	1		78.0
4	114013	SPW WTP Reservoir Fill Line Improvements	5	5	1	5	1	5	4	4	68.2	5	5	4	1	3	4	4	5		77.2
5	111002	LH WTP Miscellaneous Mechanical Improvements	5	4	1	4	4	1	4	4	66.8	5	5	4	4	4	0	3	4		77.0
6	111001	LH WTP Low Lift Pumping, Filter Backwash Pumps…	5	5	3	3	1	1	4	4	64.6	5	5	1	5	2	5	4	4		71.6
7	132003	West Service Center PS - Isolation Gate Valves for Line Pumps	5	5	3	5	4	4	1	3	76.2	5	5	3	4	3	4	2	2		70.8
8	114006	SPW WTP Replacement of Rapid Mix Units 1958 Process Train	5	5	5	5	1	2	2	3	72	5	5	3	3	2	2	3	5		69.4
9	114002	SPW WTP Low Lift and High Lift Pump Station	5	5	1	5	5	3	4	4	78.6	5	5	1	5	5	2	1	3		69.2
10	113003	SW WTP Low and High Lift Pumping & Rapid Mix Chamber BFVs…	4	5	3	4	4	2	1	2	66.6	4	4	3	4	4	2	3	2		67.6
11	114005	SPW WTP Administration Building Improvements & Underground…	4	4	3	4	4	2	2	1	63.8	4	4	4	4	4	2	2	1		67.4
12	115001	WWP WTP Yard Piping, Valves and Venturi Meters Replacement	5	5	1	3	2	2	3	3	58.6	5	5	2	3	2	4	3	3		65.4
13	122004	96-inch Main Relocation, Isolation Valves Installations…	4	5	3	5	3	4	3	2	72.6	2	5	2	5	4	5	1	2		65.2
14	114007	SPW WTP Powdered Activated Carbon System Improvements	5	5	5	5	2	3	1	1	71.4	5	5	3	4	1	5	2	1		63.8
15	114011	SPW WTP Steam, Condensate Return, and Compressed Air…	5	5	1	3	4	1	3	3	63.8	5	5	1	4	3	1	2	4		62.4
16	122003	Waterworks Park WTP to Northeast WTP Transmission Main	3	3	1	3	1	5	5	3	53.2	1	5	1	5	1	5	5	5		62.4
17	111006	LH WTP Replacement of Filter Instrumentation and Raw Water…	4	5	5	5	1	1	1	2	64.2	4	3	3	3	2	4	2	5		62.2
18	114001	SPW WTP 1958 Filter Rehabilitation and Auxiliary Facilities	4	4	3	4	2	3	2	3	62.2	4	4	3	4	2	3	2	3		62.2
19	114010	SPW WTP Yard Piping and High Lift Header Improvements	5	2	4	1	2	3	2	2	53.8	5	5	2	3	2	2	3	3		62.2
20	112001	NE WTP Yard Piping Replacement (State Fair Valve Rehab)	5	4	1	1	1	2	3	2	46	5	5	2	3	2	2	3	3		62.2
21	132012	Ypsilanti PS Improvements	5	5	3	4	2	2	5	3	72	5	4	1	4	3	2	3	3		61.2
22	331001	Roofing Systems Replacement at Water Plants and Booster…	5	3	4	5	3	2	4	2	71.4	5	5	3	5	2	1	1	1		61.0

Rank	CIP No.	Title	1	2	3	4	5	6	7	8	PM Score	1	2	3	4	5	6	7	8	Modifier	RC Score
23	114012	SPW WTP Water Treatment Plant 1930 Filter Building-Roof…	5	4	4	4	2	2	4	3	70.6	5	5	3	5	2	1	1	1		61.0
24	351001	Water Facility Lighting Renovations	5	5	3	1	4	3	5	5	77.4	3	3	3	4	3	1	3	4		60.8
25	122013	14 Mile Transmission Main Loop	1	5	2	4	4	5	1	2	60.6	1	5	2	3	4	5	1	2		58.4
26	122016	Downriver Transmission Main Loop	1	5	2	4	4	3	1	2	57.4	1	5	2	3	4	5	1	2		58.4
27	113005	SW WTP Residuals Management	1	5	3	4	5	1	1	1	59.4	1	5	2	4	2	5	4	1		58.0
28	122007	Hannon Road Transmission Main	1	5	1	4	2	3	5	4	58.6	1	4	1	4	3	3	4	4		57.0
29	116003	Genesee and Lapeer County Transmission…	1	5	5	1	5	1	0	0	56.2	0	5	5	0	4	5	0	0		54.6
30	122006	Transmission System Water Main Work-Wick Road…	4	5	1	3	4	2	1	3	59	4	4	1	3	3	3	1	3		54.2
31	132010	West Service Center PS - Duval Rd Division Valve Upgrades	3	4	1	4	3	2	2	2	52.6	3	4	1	4	1	5	1	5		54.0
32	113002	SW WTP High Lift Pump Discharge Valve Actuators Replacement	5	5	3	4	2	3	2	1	64	4	2	3	5	2	1	1	3		53.2
33	111007	LH WTP Raw Sludge Clarifier and Raw Sludge Pumping…	5	5	3	4	3	1	1	1	62.2	5	5	1	2	2	1	4	1		53.2
34	114008	SPW WTP 1930 Sedimentation Basin Sluice Gates, Guides…	5	5	1	4	5	1	1	1	61.8	5	2	1	4	5	1	1	1		52.8
35	112002	NE WTP Low Lift Pumping Plant Caisson Rehabilitation	5	3	1	2	5	1	1	1	51.4	5	3	2	2	4	1	1	1		51.6
36	132008	Various PS's - Needs Assessment Study	3	2	2	3	2	1	1	5	46.4	3	3	1	2	2	2	4	5		51.2
37	114003	WTP Water Production Flow Metering Improvements at NE, SW…	5	5	2	2	1	4	3	3	59.8	3	5	1	1	1	5	2	4		50.6
38	113006	SW WTP Chlorine Scrubber, Raw Water Screens & Related…	3	3	1	2	5	1	1	1	46.6	3	3	1	2	5	1	1	1		46.6
39	113004	SW WTP Raw Water Sampling Modifications	2	4	5	3	3	1	0	0	53.2	1	5	5	2	1	1	0	0		44.8
40	132006	Ford Road PS - Pressure and Control Improvements	2	3	1	3	1	3	4	4	47.4	2	3	1	2	1	3	4	3		43.4
41	122005	Transmission System Water Main Work - Replacement of Schoolcraft…	5	5	1	4	5	1	2	2	65.6	3	3	1	3	3	1	1	1	*	42.0
42	111008	LH WTP Architectural Programming - Laboratory and Admin Building…	4	3	2	1	2	2	1	4	47.2	4	2	2	1	2	2	1	2		40.6
43	111004	LH WTP Electrical Tunnel Rehabilitation	3	3	2	2	4	1	1	1	46.8	3	1	2	1	4	1	1	1		38.6
44	132007	Imlay PS - Energy Management: Freeze Protection Pump Installation	1	4	1	3	1	3	3	3	44.2	1	1	1	3	1	1	4	5		37.6
45	113007	SW WTP Architectural and Building Mechanical Improvements	4	3	1	3	2	1	2	3	46.6	3	2	1	3	1	1	2	2		36.0

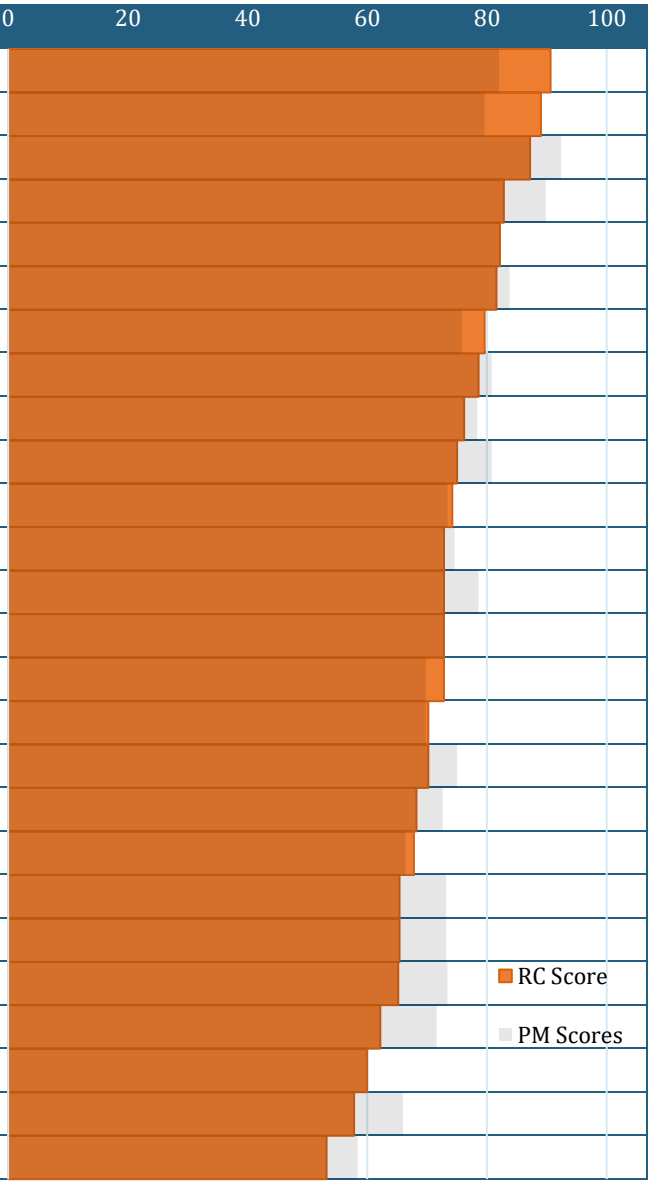
Rank	CIP No.	Title	1	2	3	4	5	6	7	8	PM Score	1	2	3	4	5	6	7	8	Modifier	RC Score
46	115003	WWP WTP Comprehensive Condition Assessment	3	3	3	1	1	1	1	1	38	2	3	1	2	1	3	1	2		35.6
47	116004	WTP Right-Sizing Implementation Plan	1	1	1	1	1	1	5	4	33.4	1	1	1	1	1	1	5	4		33.4
48	122011	Park-Merriman Water Main-Final Phase	3	4	1	2	1	1	2	1	38	1	3	1	2	1	1	2	1		30.2
49	132004	North Service Center PS - Hydraulic Surge Control	1	3	1	3	1	4	2	1	37.2	1	1	1	1	1	5	1	2		28.2
50	116002	Pennsylvania, Springwells and Northeast Raw Water Supply Tunnel…	5	5	3	5	5	5	5	1	85.6	0	0	0	0	0	0	0	0		0.0
51	112003	NE WTP High-Lift Pumping Station Electrical Improvements	4	4	1	4	2	2	2	3	53.4	0	0	0	0	0	0	0	0		0.0
52	122010	Water Main Replacement within the City of Detroit - Joy Rd…	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0.0
53	132011	West Service Center - Energy Management: VFD Installation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0.0

*Circumstances have changed. Will first perform a condition assessment. After the CA, priorities may increase.

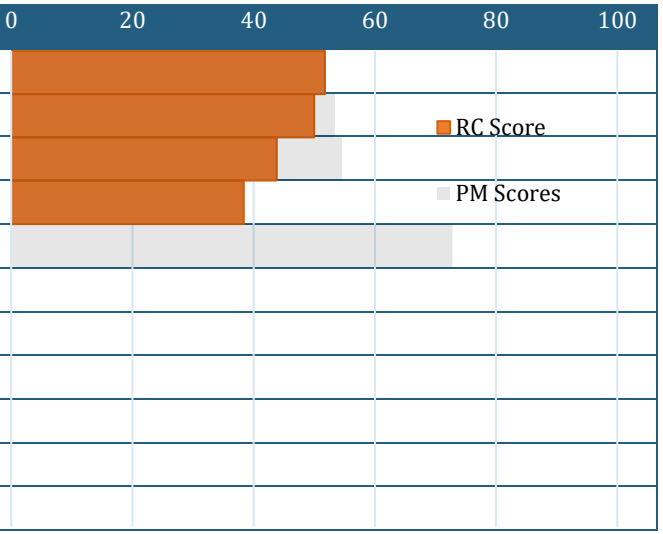
SECTION 3

PROJECT MANAGER CRITERIA SCORES: WASTEWATER

Rank	CIP No.	Title	
1	260600	CSO FACILITIES IMPROVEMENT PROGRAM	260600
2	232003	Northeast Pumping Station	232003
3	213007	WRRF Modification to Incinerator Sludge Feed Systems at Complex -II	213007
4	216007	DTE Primary Electric 3rd Feed Supply to WRRF	216007
5	216004	Rehabilitation of Various Sampling Sites and PS#2 Ferric Chloride System at WRRF	216004
6	212004	WRRF Chlorination and Dechlorination Process Equipment Improvements	212004
7	232002	Freud & Conner Creek Pump Station Improvements	232002
8	216006	Rehabilitation of Potable Water, Screened Final Effluent (SFE), Natural Gas, Secondary…	216006
9	213002	WRRF Rehabilitation of Central Offload Facility	213002
10	211006	WRRF PS No. 1 Improvements	211006
11	211008	WRRF Rehabilitation of Ferric Chloride Feed System in PS-1 and Complex B Sludge Lines	211008
12	212008	WRRF Rehabilitation of Intermediate Lift Pumps (ILPs)	212008
13	211005	WRRF PS No. 2 Improvements Phase II	211005
14	260500	CSO Outfall Rehabilitation	260500
15	222007	NIEA Evaluation and Rehabilitation from WRRF to Gratiot Ave. and Sylvester St.	222007
16	211009	WRRF Rehabilitation of the Circular Primary Clarifier Scum Removal System	211009
17	251002	Wastewater System-Wide Instrumentation & Control Software and Hardware Upgrade	251002
18	222004	Collection System Valve Remote Operation Structure Improvements	222004
19	213006	WRRF Improvements to Sludge Feed Pumps at Dewatering Facilities	213006
20	222002	Detroit River Interceptor (DRI) Evaluation and Rehabilitation	222002
21	222003	North Interceptor East Arm (NIEA) Evaluation and Rehabilitation	222003
22	211007	WRRF PS #2 Bar Racks Replacements and Grit Collection System Improvements	211007
23	214001	WRRF Relocation of Industrial Waste Control Division and Analytical Laboratory…	214001
24	216005	Rehabilitation of the Main Plant Maintenance Building & Other Maintenance…	216005
25	213008	WRRF Rehabilitation of the Ash Handling Systems	213008
26	212007	WRRF Rehabilitation of the Secondary Clarifiers	212007



Rank	CIP No.	Title	
27	222001	Oakwood District Intercommunity Relief Sewer Modification at Oakwood District	222001
28	233002	Collection System In System Storage Devices (ISDs) Improvement	233002
29	331002	Roofing Systems Replacement at GLWA WRRF, CSO Retention Treatment…	331002
30	213005	WRRF Complex I Incinerators Decommissioning and Reusability	213005
31	232001	Fairview Pumping Station - Replace Four Sanitary Pumps	232001
32	211001	WRRF Rehabilitation of Primary Clarifiers Rectangular Tanks, Drain Lines	211001
33	211002	WRRF PS No. 2 Pumping Improvements - Phase 1	211002
34	211003	WRRF Rehabilitation of Primary Clarifiers	211003
35	211004	WRRF PS #1 Rack & Grit and MPI Sampling Station 1 Improvements	211004
36	212003	WRRF Aeration System Improvements	212003
37	212006	WRRF Rouge River Outfall (RRO) Disinfection (Alternative)	212006



SECTION 4 PROJECT MANAGER CRITERIA SCORES: WASTEWATER

Rank	CIP No.	Title	1	2	3	4	5	6	7	8	PM Score	1	2	3	4	5	6	7	8	RC Score
1	260600	CSO FACILITIES IMPROVEMENT PROGRAM	4	4	5	4	4	3	4	4	82	4	4	5	4	5	5	5	4	90.6
2	232003	Northeast Pumping Station	5	3	4	4	3	5	5	4	79.6	5	5	4	4	4	5	5	4	89.0
3	213007	WRRF Modification to Incinerator Sludge Feed Systems at Complex -II	5	5	5	4	5	4	4	4	92.4	5	5	5	4	4	4	4	3	87.2
4	216007	DTE Primary Electric 3rd Feed Supply to WRRF	5	5	5	2	5	5	5	3	89.8	5	5	5	2	4	5	5	1	82.8
5	216004	Rehabilitation of Various Sampling Sites and PS#2 Ferric Chloride…	5	5	5	4	3	3	4	3	82.2	5	5	5	4	3	3	4	3	82.2
6	212004	WRRF Chlorination and Dechlorination Process Equipment Improvements	5	4	5	4	5	4	3	2	83.8	5	4	4	3	5	4	3	4	81.6
7	232002	Freud & Conner Creek Pump Station Improvements	5	5	5	3	3	4	2	2	75.8	4	4	5	3	4	5	5	1	79.6
8	216006	Rehabilitation of Potable Water, Screened Final Effluent (SFE), Natural…	5	4	4	4	4	3	4	4	80.8	5	4	4	4	4	4	3	3	78.6
9	213002	WRRF Rehabilitation of Central Offload Facility	5	5	4	4	3	3	3	4	78.4	4	4	4	4	4	4	3	3	76.2
10	211006	WRRF PS No. 1 Improvements	5	4	4	4	4	3	4	4	80.8	5	4	4	4	4	3	2	3	75.0
11	211008	WRRF Rehabilitation of Ferric Chloride Feed System in PS-1 and Complex…	4	4	4	4	3	2	4	4	73.4	4	4	4	3	4	3	3	4	74.2
12	212008	WRRF Rehabilitation of Intermediate Lift Pumps (ILPs)	4	4	5	3	3	3	4	3	74.6	4	4	5	3	3	3	4	2	72.8
13	211005	WRRF PS No. 2 Improvements Phase II	5	4	4	3	4	3	4	4	78.6	5	4	4	3	4	3	2	3	72.8
14	260500	CSO Outfall Rehabilitation	4	5	3	4	3	2	4	4	72.8	4	4	4	3	3	3	4	4	72.8
15	222007	NIEA Evaluation and Rehabilitation from WRRF to Gratiot Ave. and…	4	4	3	4	3	2	4	4	69.8	4	4	4	3	4	2	4	3	72.8
16	211009	WRRF Rehabilitation of the Circular Primary Clarifier Scum Removal System	4	4	3	4	3	2	4	4	69.8	4	4	4	5	2	2	3	4	70.2
17	251002	Wastewater System-Wide Instrumentation & Control Software…	4	4	4	4	3	3	4	4	75	5	3	4	3	3	3	3	4	70.2
18	222004	Collection System Valve Remote Operation Structure Improvements	4	4	3	4	4	4	3	3	72.6	4	4	3	5	3	2	3	3	68.2
19	213006	WRRF Improvements to Sludge Feed Pumps at Dewatering Facilities	3	4	4	3	3	3	2	4	66.4	3	4	4	5	2	2	3	4	67.8
20	222002	Detroit River Interceptor (DRI) Evaluation and Rehabilitation	5	4	4	3	3	4	4	2	73.2	5	4	3	1	3	4	5	1	65.4
21	222003	North Interceptor East Arm (NIEA) Evaluation and Rehabilitation	5	4	4	3	3	4	4	2	73.2	5	4	3	1	3	4	5	1	65.4
22	211007	WRRF PS #2 Bar Racks Replacements and Grit Collection System…	4	4	4	4	3	2	4	4	73.4	3	4	4	4	3	3	3	1	65.2

Rank	CIP No.	Title	1	2	3	4	5	6	7	8	PM Score	1	2	3	4	5	6	7	8	RC Score
23	214001	WRRF Relocation of Industrial Waste Control Division and…	3	4	5	2	3	3	3	5	71.6	3	2	5	2	2	3	3	5	62.2
24	216005	Rehabilitation of the Main Plant Maintenance Building & …	3	3	3	3	3	3	3	3	60	3	3	3	3	3	3	3	3	60.0
25	213008	WRRF Rehabilitation of the Ash Handling Systems	4	4	3	4	3	2	3	3	66	4	3	3	4	3	1	3	1	57.8
26	212007	WRRF Rehabilitation of the Secondary Clarifiers	4	3	4	3	3	3	1	1	58.4	4	3	4	3	1	4	1	1	53.2
27	222001	Oakwood District Intercommunity Relief Sewer Modification at Oakwood District	1	4	2	1	3	4	3	3	51.8	1	4	2	1	3	4	3	3	51.8
28	233002	Collection System In System Storage Devices (ISDs) Improvement	4	3	3	3	2	2	1	3	53.4	4	3	3	3	1	2	1	3	50.0
29	331002	Roofing Systems Replacement at GLWA WRRF, CSO Retention Treatment…	4	4	4	2	2	1	2	1	54.6	4	4	2	1	1	1	3	1	43.8
30	213005	WRRF Complex I Incinerators Decommissioning and Reusability	2	3	1	3	1	1	2	3	38.4	2	3	1	3	1	1	2	3	38.4
31	232001	Fairview Pumping Station - Replace Four Sanitary Pumps	4	4	4	3	3	3	4	4	72.8	0	0	0	0	0	0	0	0	0.0
32	211001	WRRF Rehabilitation of Primary Clarifiers Rectangular Tanks, Drain Lines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
33	211002	WRRF PS No. 2 Pumping Improvements - Phase 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
34	211003	WRRF Rehabilitation of Primary Clarifiers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
35	211004	WRRF PS #1 Rack & Grit and MPI Sampling Station 1 Improvements	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
36	212003	WRRF Aeration System Improvements	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
37	212006	WRRF Rouge River Outfall (RRO) Disinfection (Alternative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0

VI. PROJECTS BY CATEGORY

SECTION 1 WATER

All financial figures are in thousands of dollars ($1,000's). In the Capital Expense Category (CapEx Category), projects are funded with Construction Bonds (CB) or the Improvement & Extension Fund (IE). Cost Allocation has been listed as Common-to-All (CTA) or Suburban Only (Suburb. Only), as explained in Chapter III. Projects in the "Centralized Services" category (CIP number begins with 3) but funded by the water CIP are listed in the Centralized Services section.

Table VI-1. Water CIP Projects

CIP #	Title	Year Added	CapEx Category	Cost Allocation	Lifetime Actual Thru FY 2017 (unaudited)	Projected Expenditures									
						FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond	2018-2022 CIP Total	Project Total	Percent of W/S CIP
111001	LH WTP Low Lift Pumping, Filter Backwash Pumps & Flocculation Improvements	2010	CB	CTA	0	0	0	4,071	1,162	10,350	20,075	19,575	35,658	55,233	3.6%
111002	LH WTP Miscellaneous Mechanical Improvements	2014	CB	CTA	309	2,098	3,600	1,800	0	0	0	0	5,400	7,807	0.5%
111004	LH WTP Electrical Tunnel Rehabilitation	2014	CB	CTA	0	240	3,892	1,165	0	0	0	0	5,057	5,297	0.5%
111005	LH WTP Concrete Crack Repair	2014	CB	CTA	755	0	0	0	0	0	0	0	0	755	0.0%
111006	LH WTP Replacement of Filter Instrumentation and Raw Water Flow Metering Improvements	2014	CB	CTA	253	549	10,428	10,414	4,582	0	0	0	25,424	26,226	2.6%
111007	LH WTP Raw Sludge Clarifier and Raw Sludge Pumping System Improvements	2016	CB	CTA	9	500	212	6,450	0	0	0	0	6,662	7,171	0.7%
111008	LH WTP Architectural Programming - Laboratory and Admin Building Architectural Improvements Study	2017		CTA	0	0	300	0	0	0	0	0	300	300	0.0%
112001	NE WTP Yard Piping Replacement (State Fair Valve Rehab)	2014	CB	CTA	0	38	1,100	1,850	0	0	0	0	2,950	2,988	0.3%
112002	NE WTP Low Lift Pumping Plant Caisson Rehabilitation	2014	CB	CTA	163	255	1,075	258	0	0	0	0	1,333	1,751	0.1%
112003	NE WTP High-Lift Pumping Station Electrical Improvements	2017	CB	CTA	0	0	0	3,488	15,750	15,750	15,750	14,550	50,738	65,288	5.2%
113001	SW WTP Sludge Treatment & Waste Wash Water Treatment Facilities	2003	CB	CTA	40	0	0	0	0	0	0	0	0	40	0.0%
113002	SW WTP High Lift Pump Discharge Valve Actuators Replacement	2014	CB	CTA	115	230	4,135	1,045	0	0	0	0	5,180	5,525	0.5%
113003	SW WTP Low and High Lift Pumping & Rapid Mix Chamber BFVs, Sluice Gates, Flocculation & Filtration System Improvements	2014	CB	CTA	0	12	50	6,222	6,222	17,675	25,190	94,720	55,359	150,091	5.6%
113004	SW WTP Raw Water Sampling Modifications	2014	CB	CTA	142	155	3,025	0	0	0	0	0	3,025	3,322	0.3%
113005	SW WTP Residuals Management	2017	CB	CTA	0	0	0	0	0	0	0	1,120	0	1,120	0.0%

CIP #	Title	Year Added	CapEx Category	Cost Allocation	Lifetime Actual Thru FY 2017 (unaudited)	Projected Expenditures									
						FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond	2018-2022 CIP Total	Project Total	Percent of W/S CIP
113006	SW WTP Chlorine Scrubber, Raw Water Screens & Related Improvements	2017	CB	CTA	0	0	0	0	0	0	0	7,075	0	7,075	0.0%
113007	SW WTP Architectural and Building Mechanical Improvements	2017	CB	CTA	0	0	0	0	0	0	0	37,391	0	37,391	0.0%
114001	SPW WTP 1958 Filter Rehabilitation and Auxiliary Facilities	2002	CB	CTA	82,682	10,563	5,687	0	0	0	0	0	5,687	98,932	0.6%
114002	SPW WTP Low Lift and High Lift Pump Station	2004	CB	CTA	22	0	50	1,375	1,400	1,650	15,050	94,950	19,525	114,497	2.0%
114003	WTP Water Production Flow Metering Improvements at NE, SW, and SPW WTP	2014	IE	CTA	186	50	200	200	2,250	3,200	2,200	0	8,050	8,286	0.8%
114004	SPW WTP Concrete Crack Repairs	2014	CB	CTA	495	0	0	0	0	0	0	0	0	495	0.0%
114005	SPW WTP Administration Building Improvements & Underground Fire Protection Loop	2014	CB	CTA	0	25	175	250	2,308	3,250	2,225	0	8,208	8,233	0.8%
114006	SPW WTP Replacement of Rapid Mix Units 1958 Process Train	2014	CB	CTA	104	61	1,535	0	0	0	0	0	1,535	1,700	0.2%
114007	SPW WTP Powdered Activated Carbon System Improvements	2014	CB	CTA	0	0	0	0	0	0	50	5,763	50	5,813	0.0%
114008	SPW WTP 1930 Sedimentation Basin Sluice Gates, Guides & Hoists Improvements	2014	CB	CTA	0	38	2,038	7,050	7,050	1,025	0	0	17,163	17,201	1.7%
114009	SPW WTP Service Area Redundancy Study	2014	CB	CTA	193	187	103	0	0	0	0	0	103	483	0.0%
114010	SPW WTP Yard Piping and High Lift Header Improvements	2012	CB	CTA	0	0	0	0	0	0	0	139,450	0	139,450	0.0%
114011	SPW WTP Steam, Condensate Return, and Compressed Air Piping Improvements	2012	CB	CTA	280	40	2,160	5,250	1,325	0	0	0	8,735	9,055	0.9%
114012	SPW WTP Water Treatment Plant 1930 Filter Building-Roof Replacement	2016	CB	CTA	0	50	1,325	0	0	0	0	0	1,325	1,375	0.1%
114013	SPW WTP Reservoir Fill Line Improvements	2016	CB	CTA	120	574	6,640	0	0	0	0	0	6,640	7,334	0.7%
114014	SPW WTP Underground Fire Protection Loop Improvements	2016	CB	CTA	0	0	0	0	0	0	0	0	0	0	0.0%
114015	SPW WTP Emergency Grating Replacement	2017	CB	CTA	254	2,550	0	0	0	0	0	0	0	2,804	0.0%
115001	WWP WTP Yard Piping, Valves and Venturi Meters Replacement	2007	CB	CTA	9	2,050	1,831	25,150	25,140	0	0	0	52,121	54,180	5.3%
115002	WWP WTP Concrete and Road Improvements	2014	CB	CTA	1,951	0	0	0	0	0	0	0	0	1,951	0.0%
115003	WWP WTP Comprehensive Condition Assessment	2014	IE	CTA	0	315	290	0	0	0	0	0	290	605	0.0%
115004	WWP WTP Chlorine System Upgrade	2017	CB	CTA	371	912	8,882	0	0	0	0	0	8,882	10,165	0.9%
116001	WTP General Purpose Pennsylvania, Springwells and Northeast Raw Water Supply Tunnel Improvements	2014	CB	CTA	0	0	0	0	0	0	0	0	0	0	0.0%
116002	Pennsylvania, Springwells and Northeast Raw Water Supply Tunnel Improvements	2016	CB	CTA	10	4,651	14,651	20,224	379	0	0	0	35,254	39,915	3.6%

CIP #	Title	Year Added	CapEx Category	Cost Allocation	Lifetime Actual Thru FY 2017 (unaudited)	Projected Expenditures							2018-2022 CIP Total	Project Total	Percent of W/S CIP
						FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond			
116003	Genesee and Lapeer County Transmission System Improvements	2016	CB	CTA	0	3,650	0	0	0	0	0	0	0	3,650	0.0%
116004	WTP Right-Sizing Implementation Plan	2017	IE	CTA	0	533	1,600	0	0	0	0	0	1,600	2,133	0.2%
122001	Parallel 42-Inch Main in 24 Mile Road from Rochester Station to Romeo Plank Road	2005	CB	CTA	32,571	815	0	0	0	0	0	0	0	33,386	0.0%
122002	Replacement of Five (5) PRV Pits of Treated Water Transmission System	2010	CB	CTA	1,697	790	0	0	0	0	0	0	0	2,487	0.0%
122003	Waterworks Park WTP to Northeast WTP Transmission Main	2014	CB	CTA	19	2,500	6,604	20,050	35,050	34,050	32,050	0	127,804	130,323	13.0 %
122004	96-inch Main Relocation, Isolation Valves Installations, and New Parallel Main	2016	CB	CTA	460	1,678	3,684	6,292	20,926	49,684	43,734	6,464	124,320	132,922	12.6 %
122005	Transmission System Water Main Work - Replacement of Schoolcraft Water Main	2016	CB	CTA	0	50	50	6,800	6,800	0	0	0	13,650	13,700	1.4%
122006	Transmission System Water Main Work-Wick Road Parallel Water Main	2016	CB	CTA	23	50	5,050	7,050	5,025	0	0	0	17,125	17,198	1.7%
122007	Hannon Road Transmission Main	2016	CB	CTA	0	25	550	2,300	2,300	2,300	2,300	550	9,750	10,325	1.0%
122009	Water System Improvements in Joy Road from Southfield Road to Trinity	2014	CB	CTA	107	0	0	0	0	0	0	0	0	107	0.0%
122010	Water Main Replacement within the City of Detroit - Joy Rd from Greenfield to Schaefer and Davison Ave from Lindwood to Livernois	2014	CB	CTA	0	2,679	220	0	0	0	0	0	220	2,899	0.0%
122011	Park-Merriman Water Main-Final Phase	2015	CB	CTA	0	50	3,100	3,050	0	0	0	0	6,150	6,200	0.6%
122012	36-inch Water Main in Telegraph Road	2012	CB	CTA	8,125	2,025	0	0	0	0	0	0	0	10,150	0.0%
122013	14 Mile Transmission Main Loop	2017	CB	CTA	0	42	1,694	3,380	11,578	19,581	14,682	3,589	50,915	54,546	5.2%
122014	Romulus 48-inch Water Main Installation	2015	CB	CTA	3,840	0	0	0	0	0	0	0	0	3,840	0.0%
122015	30" Water main Replacement - Water main Replacement Under Jefferson & Rouge River	2016	CB	CTA	2,345	0	0	0	0	0	0	0	0	2,345	0.0%
122016	Downriver Transmission Main Loop	2017	CB	CTA	0	84	84	684	2,208	5,834	10,152	18,627	18,962	37,673	1.9%
132001	Wick PS - Rehabilitation	2004	CB	CTA	0	200	0	0	0	0	0	0	0	200	0.0%
132002	Joy PS - Replace Switchgear			CTA	669	0	0	0	0	0	0	0	0	669	0.0%
132003	West Service Center PS - Isolation Gate Valves for Line Pumps	2014	CB	CTA	66	93	2,803	0	0	0	0	0	2,803	2,962	0.3%
132004	North Service Center PS - Hydraulic Surge Control	2014	CB	CTA	75	17	162	575	1,150	1,150	0	0	3,037	3,129	0.3%
132006	Ford Road PS - Pressure and Control Improvements	2014	IE	CTA	8	200	191	1,190	1,190	0	0	0	2,571	2,779	0.3%
132007	Imlay PS - Energy Management: Freeze Protection Pump Installation	2014	CB	CTA	0	21	167	450	0	0	0	0	617	638	0.1%
132008	Various PS's - Needs Assessment Study	2014	IE	CTA	33	600	1,400	0	0	0	0	0	1,400	2,033	0.1%
132009	Study Phase for East Service Center Pump	2015	IE	CTA	10	0	0	0	0	0	0	0	0	10	0.0%

CIP #	Title	Year Added	CapEx Category	Cost Allocation	Lifetime Actual Thru FY 2017 (unaudited)	Projected Expenditures							2018-2022 CIP Total	Project Total	Percent of W/S CIP
						FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond			
132010	West Service Center PS - Duval Rd Division Valve Upgrades	2017	CB	CTA	0	33	2,050	11,050	11,050	11,050	2,025	0	37,225	37,258	3.8%
132011	West Service Center - Energy Management: VFD Installation	2016	CB	CTA	0	1,667	1,667	0	0	0	0	0	1,667	3,334	0.2%
132012	Ypsilanti PS Improvements	2017	CB	CTA	0	142	292	2,200	1,950	1,950	1,950	1,925	8,342	10,409	0.8%
161001	Water Master Plan Update	2010	CB	CTA	330	0	0	0	0	0	0	0	0	330	0.0%
170100	Water Treatment Plant /Pump Station Allowance	2012	CB	CTA	6,777	9,935	9,956	10,000	10,000	10,000	10,000	0	49,956	66,668	5.1%
170200	As Needed Construction Materials, Environmental Media and Special Testing Services, Construction Inspection, and Other Technical Services	2014	CB	CTA	0	150	450	550	550	0	0	0	1,550	1,700	0.2%
170300	Water Treatment Plant Automation Program	2017	CB	CTA	13	1,545	1,500	1,500	1,500	1,500	1,500	0	7,500	9,058	0.8%
170400	Water Transmission Improvement Program	2010	CB	CTA	1,075	40	9,910	9,910	9,910	9,910	9,910	0	49,550	50,665	5.0%
170500	Transmission System Valve Assessment and Rehabilitation/Replacement	2017	CB	CTA	0	5,000	5,000	3,025	2,175	4,850	4,850	0	19,900	24,900	2.0%
170600	Water Transmission Main Asset Assessment Program	2017	CB	CTA	0	1,919	1,919	1,919	1,919	1,919	1,919	0	9,595	11,514	1.0%
170700	Reservoirs Inspection, Repair and Rehabilitation Program	2007	CB	CTA	12,914	3,400	0	0	0	0	0	0	0	16,314	0.0%
170800	Reservoir Inspection, Design and Rehabilitation at Imlay Station, Adams Station, Haggerty Station, LH-WTP, SPW-WTP and SW-WTP	2016	CB	CTA	0	38	1,025	3,768	3,768	3,768	3,768	3,768	16,097	19,903	1.6%
170900	Suburban Water Meter Pit Rehabilitation and Meter Replacement	2014	CB	SO	0	4,000	4,000	4,000	4,000	4,000	4,000	0	20,000	24,000	2.0%

The regional water system draws its water from the largest fresh water source in North America, the Great Lakes, with Lake Huron to the north, the Detroit River to the south and Lake St. Clair to the east. With access to nearly 2 billion gallons of high quality source water and with three separate intakes, the Authority has highly reliable and more than sufficient source water for current and projected demands.

The major components of the regional water system include three intake facilities, five treatment plants, an extensive conveyance system consisting of over 800 miles of transmission mains throughout the service area, 19 booster pumping stations and 32 water storage reservoirs (14 at the water treatment plants and 18 at booster stations). Water flow and pressure throughout the Water System are monitored and controlled by a Systems Control Center located in the Central Services Facility.

Physical Facilities

Intake Facilities

The Water System's three intake facilities are listed below and are generally in adequate to good working order and repair.

- The **Lake Huron intake,** located in Lake Huron, approximately 5 miles north of Port Huron and 5 miles into the lake, was placed in operation in 1974. This intake supplies raw water through a tunnel to the Lake Huron Water Treatment Plant.
- The **Belle Isle intake**, located at the eastern end of Belle Isle where Lake St. Clair flows into the Detroit River, was placed in operation in 1931. This intake supplies raw water to the Water Works Park, Springwells and Northeast Water Treatment Plants.
- The **Fighting Island intake** and tunnel, located under the Detroit River on the Canadian side just west of the northern end of Fighting Island, was placed in operation in 1964. This intake supplies raw water to the Southwest Water Treatment Plant.

Water Treatment Plants

Raw water from the intake facilities is treated at the regional water system's water treatment plants, which includes screening, filtering, bacteria control, and taste and odor control. Each of the five water treatment plants in the regional water system was constructed with the capability to treat the water in accordance with federal requirements under the Safe Drinking Water Act. In the opinion of the Authority, based upon physical evaluations conducted by its consultants, no significant improvements to the water treatment plants are presently required to meet such requirements. In addition, each treatment plant is equipped with its own laboratory facilities for the examination of drinking water which are recertified periodically (every three years) by the Michigan Department of Public Health. The treatment plants are more particularly described in the following table. A summary of the treatment plants is shown in Table VI-2 on the following page.

Table VI-2. Treatment plant history and rated capacity

Plant	Placed in Operation	Rated Capacity (MGD)
Lake Huron	1974	400
Southwest	1964	240
Northeast	1956	300
Springwells[1]	1931/1958	540
Water Works Park	2003	240

[1] A major addition was completed in 1958, doubling the capacity of such water treatment plant by adding a new reservoir, sedimentation basin and filtration facility. Filter upgrades at Springwells limit plant capacity to 300 million gallons per day (MGD) until construction is complete.

WATER DELIVERY SYSTEM

The Authority operates and maintains a regional water system consisting of over 800 miles of main including most of the transmission mains within the City limits and certain transmission mains throughout the wholesale service area. The regional water system connects with the transmission and distribution mains owned and operated by the wholesale municipal customers including the City of Detroit.

The transmission system is laid out to provide adequate pressures that are reinforced by use of booster stations and reservoirs, where necessary. Much of the transmission system is interconnected and flow of water can be controlled, particularly in emergency conditions, to flow in either direction by opening or closing valves. Water pressures can be boosted to overcome typical losses due to an emergency situation.

MONITORING FACILITIES

The Water System Control Center controls and monitors the transmission of water throughout the regional water system. Operators in the Systems Control Center can remotely control the pump stations at the treatment plants and the 19 booster stations to adjust flows and pressures to meet the changing demands of customer communities.

Regional Water System Master Plan

The Water Master Plan Update was accepted by the GLWA Board on August 24, 2016. This plan was materially completed in 2015 (the "2015 Water Master Plan Update" or the "Update") with final closeout in 2016. Customer communities were engaged in the preparation of the 2015 Water Master Plan Update. This provided a broader perspective utilizing the region's entire infrastructure for public benefit to leverage existing infrastructure before investing in new infrastructure. The 2015 Water Master Plan Update has been utilized to develop the Regional Water System CIP.

The 2015 Water Master Plan Update, which covers a period of 20 years, instead of the 50 years of prior master plans, recognizes the national trend of declining demand. A key focus was to establish a strategic infrastructure and operating plan associated with this reality. The update recommended right-sizing the capacity of the regional water system based on the current lower projections of population and water volumes.

The 2015 Water Master Plan Update found that the Authority's combined water treatment plant design capacity was estimated to be over 60 percent greater than the forecasted 20-year water demands. The total rated capacity of the existing five water treatment plants is 1.7 billion gallons per day. The 2015 Master Plan Update identified likely maximum demands in the range of up to 1.0 billion gallons per day during the 20-year planning period. This provided the rationale to evaluate the possibility of repurposing one or more water treatment plants to strategically align capacity and service requirements and planning for structural de-rating of capacity as warranted at the remaining four water treatment plants. The 2015 Master Plan Update recommended converting the existing Northeast Water Treatment Plant into a storage and pumping facility, thereby eliminating the need to invest in improvements that would otherwise be required to maintain rated capacity, and investing in the four remaining water treatment plants.

The 2015 Water Master Plan Update is designed to provide the System with flexibility to meet multiple growth scenarios and regulatory changes in the future, furthering GLWA's sustainability goals. Realigning water treatment plant capacity with forecasted demands will require additions and modifications to the existing water transmission system. The first five years of the 2015 Water Master Plan Update contain several capital projects related to the additions and modifications to the existing water transmission system, a number of which are in the GLWA 2019-2023 CIP. An example of the update's financial benefits is an estimated $400 million of capital cost avoidance. In August 2016, the 2015 Water

Master Plan Update was further updated to decommission and repurpose the Northeast Water Treatment Plant, provide a new transmission system serving the Authority's northeast service area and add enhanced water System redundancy and long- term serviceability to a large (96 inch) water main through completion of a repair, relocation and isolation valve installation project for that water main.

Service Area and Customers

The Authority currently provides wholesale water services in a service area encompassing 981 square miles and serves all or a portion of eight Michigan counties in southeast Michigan, including Oakland, Macomb, Wayne, Lapeer, Genesee, Washtenaw, St. Clair and Monroe Counties. Figure VI-1 displays GLWA's service area. Approximately 4 million people, or nearly 40 percent of the total population of the State of Michigan, live in the Authority's water service area. Suburban customers comprise approximately 82 percent of the population served by the Authority, and the City of Detroit comprise the remainder served by the Authority. Under certain circumstances, subject to the Authority's System optimization guidelines, the Authority's water service area may be expanded to include additional communities. The Authority's customer communities are served via wholesale service contracts and the City retail customer class is served via the terms of the Water and Sewer Services Agreement.

Wholesale Water Customers

The customers of the regional water system include 127 communities served through various forms of contracts. The City of Detroit is served pursuant to the Water and Sewer Services Agreement. To date, model contracts for 78 of the 88 wholesale customers have been negotiated, approved, and are in effect. Of the other 10 wholesale customers, 7 are served under older contract structures, the Genesee County Drain Commissioner is served via a 30-year Reciprocal Backup Water Service Contract and 2 customers receive water services on a non-contract basis.

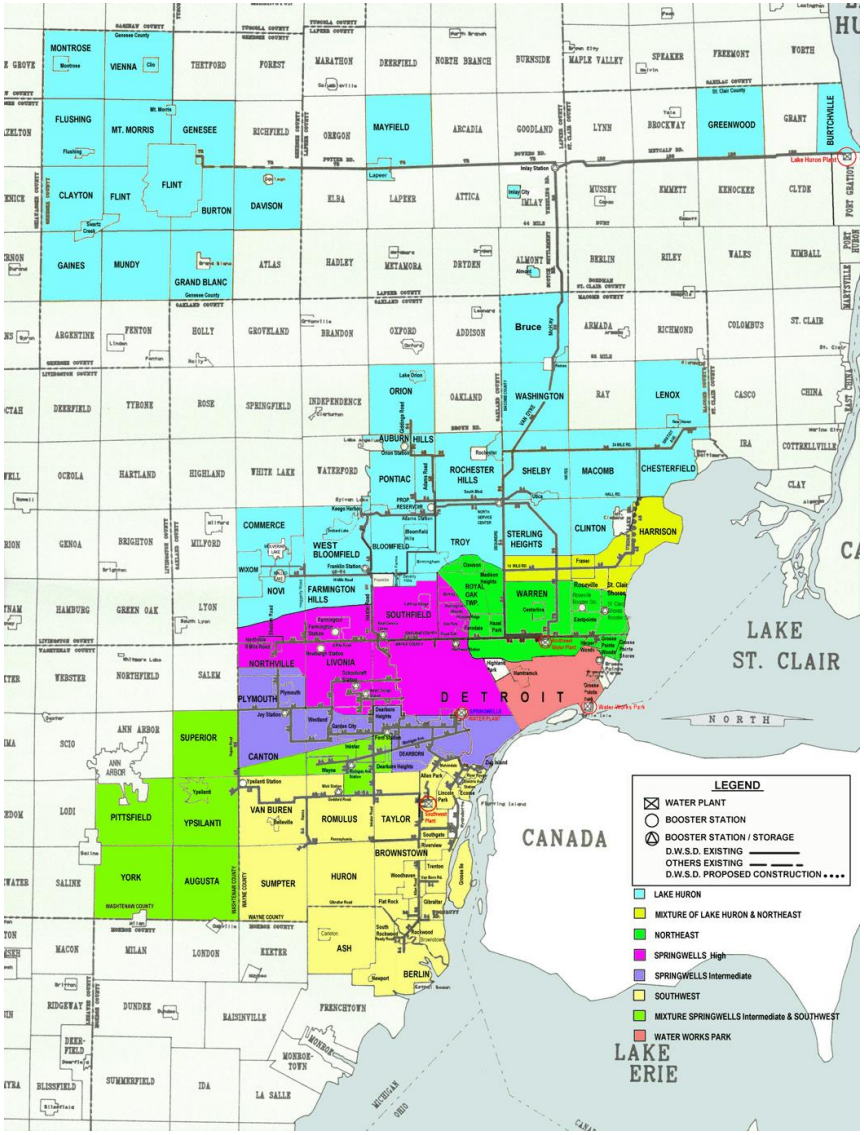


Figure VI-1. GLWA water service area

The 78 customers served by the new model contracts comprise over 92 % of total billed revenues from regional water system wholesale customers (exclusive of Detroit).

The model water service contracts generally provide for (i) delivery of water by the Authority to the wholesale customer at designated metered points at specified rates of flow and pressure and (ii) payment by the wholesale customer for all water supplied at reasonable charges established by the Authority. The Authority is responsible for meeting all water quality requirements at the designated metered points. The wholesale customer is solely responsible for distributing water from the points of delivery to its retail customers, for local billing, collection and rate setting.

The model contracts have a 30-year initial term and automatically renew for an additional 10-year term unless a party to the contract provides written prior notice of intent to terminate at least five years prior to the end of the then-current contract term. In the event of an early termination, the model contract provides that wholesale customers are liable to GLWA for the payment of any costs incurred by the Authority related to the provision of services to the customer community, unless the termination is for cause, in which case GLWA has cure rights. The model contract provides that GLWA has no responsibility for distributing, operating, repairing, replacing or maintaining any portion of the customer community's retail water or wastewater system, that GLWA shall be the sole supplier of service to the customer's service area and that the customer is prohibited from commingling Authority water with water from any other source without the prior approval of GLWA.

The model contracts also provide that the Water Technical Advisory Committee (the "TAC"), established to facilitate a cooperative working relationship between GLWA and its customer communities, will remain in place for the contract term. In addition, the model contracts include other provisions required for the orderly operation of an integrated water supply and distribution system such as the following: (i) restrictions on redistribution outside the limits of the particular municipality or other public entity without the consent of the Authority; (ii) measurement of water furnished by meters; (iii) the metered flow of water is the basis for billing; (iv) prohibition against combining of regional water system supplied water with water from any other source without prior written approval of the Authority to ensure a uniform quality of water throughout the area; (v) municipal acceptance of the Authority's standards for construction of distribution mains and Authority approval of construction plans therefor to ensure a uniform standard throughout the area; (vi) Authority commitments regarding notification of rate changes; (vii) payment and late payment terms; (viii) delineation of maintenance responsibilities; (ix) specific water pressure commitments by the Authority; and (x) maximum day, peak hour and annual volume commitments by the wholesale customer.

1.1. Water Treatment Plants & Facilities

GLWA operates and maintains five water treatment facilities that provide water to GLWA customer communities in Southeast Michigan. The Springwells, Northeast, Southwest, Lake Huron, and Water Works Park Water Treatment Plants have a maximum rated treatment capacity of 1,720 million gallons per day and firm high service pumping capacity of 2,400 million gallons per day. The high service pumping capacity exceeds the rated treatment capacity to assist in meeting peak hourly demands from finished water storage. Applicable treatment and pumping capacities and other data can be seen in Table VI-3 on the following page.

Four of the five plants (Northeast, Springwells, Southwest and Water Works Park) are conventional treatment facilities with the following process trains: rapid mix, coagulation, flocculation, sedimentation, granular media filtration, and disinfection. Lake Huron is the only facility operated as a "modified direct filtration" plant, which means the sedimentation basins do not require a

minimum detention time of 4 hours. In addition, Water Works Park is the only plant that employs intermediate ozonation for primary disinfection control. All five plants use the same chemical systems including alum for coagulation, chlorine for pre-oxidation and primary disinfection (excluding Water Works Park), powdered activated carbon (PAC) for taste and odor (T&O) control, phosphoric acid for corrosion control, and fluoride for dental health protection. Polymers are also added at several facilities to enhance coagulation and filtration as well as for thickening and dewatering of alum residuals. Two of the five plants, Southwest and Water Works Park, employ automated residuals removal from the sedimentations basins. The residuals are thickened and dewatered on site along with backwash wastewater, and disposed of at landfills. Lake Huron's basins are cleaned manually on an annual basis and the sludge is discharged to the sludge drying lagoons. The lagoons also receive thickened solids from the waste wash water treatment facility, which processes filter backwash wastewater. The Springwells and Northeast plants do not have automated alum residuals collection in the sedimentation basins or a thickening treatment process on site for alum residuals or backwash wastewater. At both facilities, the basins have been manually cleaned on an annual or biannual basis and the solids discharged to the wastewater collection system; backwash wastewater is also discharged to the wastewater collection system.

Table VI-3. Water Treatment Plant Capacity, Finished Water Storage and Areas Served Summary

Facility	Year Placed in Service	Rated Treatment Capacity (MGD)	Firm High Service Pumping Capacity (MGD)	Finished Water Storage Volume (MG)	Areas Served
Springwells WTP	1931 First Train; 1958 Second Train	540(1)	260, IPD* 450, HPD*	60	Detroit, Northern Wayne County, Eastern Washtenaw County, Oakland County, Southeastern Macomb County, Western Wayne County
Northeast WTP	1956	300	400	30	Northeast Detroit/Wayne County, Southern Macomb County, Southeast Oakland County
Southwest WTP	1964	240	310	30	Southern Wayne County, Northern Monroe County, Eastern Washtenaw County
Lake Huron WTP	1974	400	420	44	Genesee County, Lapeer County, St. Clair County, Macomb County, Oakland County
Water Works Park WTP	2003	240	560	28	Eastside of Detroit, Eastern Wayne County
System Totals:		**1,720**	**2,400**	**192**	***IPD = Intermediate Pressure District, HPD = High Pressure District***

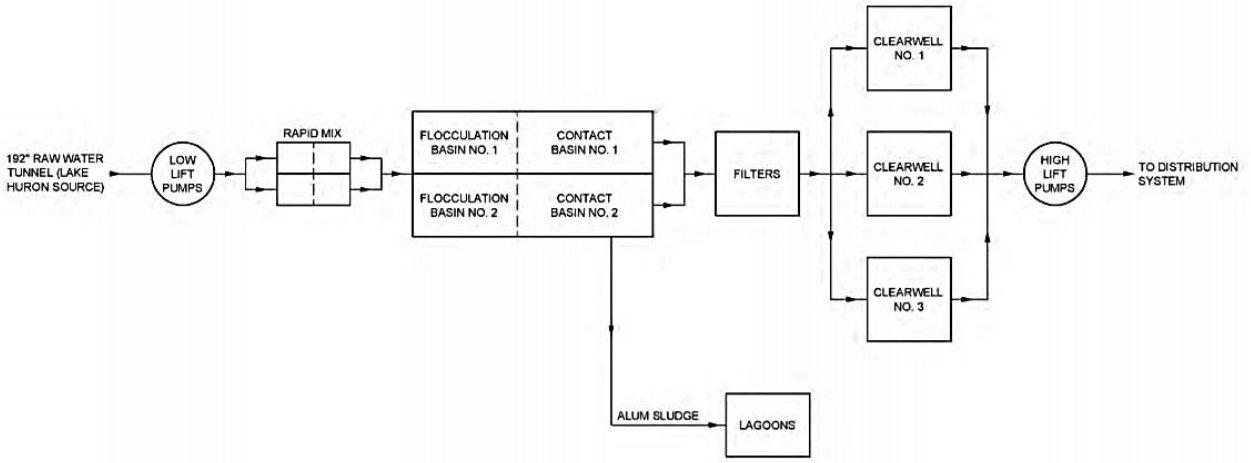
1.1.1. Lake Huron Water Treatment Plant

The Lake Huron Water Treatment Plant began full-scale operations in 1974. The plant is located at 3993 Metcalf Road in Fort Gratiot, Michigan. The Lake Huron plant was designed to be easily expandable to meet the needs of growing populations in the communities it serves to the north of Detroit. In 2004, after completion of a pilot study along with various upgrades to the process trains, the MDEQ rated the maximum capacity of Lake Huron at 400 MGD. Lake Huron is the only GLWA facility that is operated in "modified" direct filtration mode. The sedimentation basins do not meet 10-State standards and thus are not considered to be true settling basins by the MDEQ. The raw water

source for the plant is Lake Huron. The raw water tunnel is designed for a maximum capacity of 1200 MGD and 800 MGD during cold weather. The plant was constructed with provisions to increase the capacity by adding additional process trains and pumping units to obtain the maximum production capacity of 1200 MGD. In the early 2000's a variety of process treatment improvements were constructed at the Lake Huron Water Treatment Plant. These improvements included new high lift and backwash water pumps (including discharge piping and valves), rehabilitation of two clear wells and the high service suction well, filtration capacity improvements, pretreatment improvements and filter control modification, and a new treatment facility for filter backwash wastewater.

Figure VI-2. Lake Huron WTP

Figure VI-3. Lake Huron WTP process diagram



1.1.2. Northeast Water Treatment Plant

The Northeast Water Treatment Plant at 11000 E. Eight Mile Road in Detroit became the former Detroit Water System's third water treatment plant. Dedicated in 1956, the plant was built to meet the needs of suburban communities located east and north of the city. The source of raw water is the Belle Isle intake, located in the Detroit River, which also serves Springwells and Water Works Park. The raw water is chlorinated, fluoridated and screened at Water Works Park before it flows to Northeast by gravity. Low lift pumps lift the raw water to the process trains, which operate in parallel. With a maximum rated capacity of 300 MGD, the plant process trains consist of rapid mix, flocculation, sedimentation, and dual-media gravity filtration.

Figure VI-4. Northeast WTP

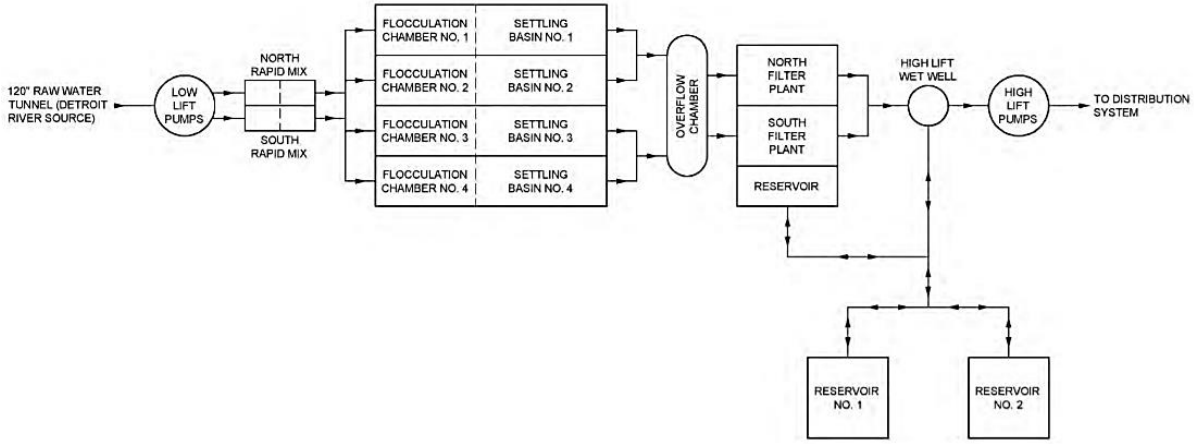


Figure VI-5. Northeast WTP process diagram

1.1.3. Southwest Water Treatment Plant

Detroit's fourth water treatment plant, Southwest, located at 14700 Moran Road in Allen Park, became operational in 1964. The Southwest Water Treatment Plant was constructed in 1963, at which time it was owned and operated by Wayne County. Through an agreement with Wayne County, the City of Detroit purchased this plant to regionalize water services in Southeast Michigan. Raw water for Southwest flows by gravity from the Detroit River through an intake at Fighting Island. The plant has a rated capacity of 240 MGD. The original plant was designed with the ability to be upgraded to 320 MGD via equipment replacement. There are also spare raw water conduits that can accommodate an expansion up to 480 MGD. The low lift pumps lift the raw water for treatment through the process trains, which operate in parallel. The Southwest Water Treatment Plant also has a Residuals Handling Facility to treat filter backwash wastewater and alum sludge residuals.

Figure VI-6. Southwest WTP

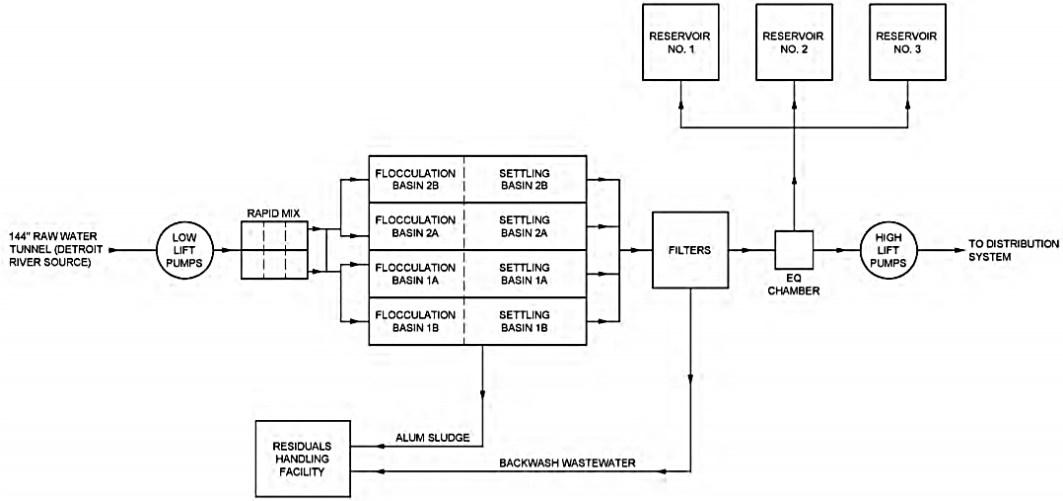


Figure VI-7. Southwest WTP process diagram

1.1.4. Springwells Water Treatment Plant

The Springwells Water Treatment Plant at 8300 W. Warren Avenue in Dearborn is the oldest of the GLWA water treatment facilities. At the time of its dedication in 1935, it was the largest water treatment facility in the world. The first train was constructed in 1930 and has a maximum rated capacity of 340 MGD and the second train constructed in 1958 has a maximum rated capacity of 200 MGD, for a total capacity of 540 MGD. Like Northeast, the Springwells plant receives its raw water from the Belle Isle Intake. The raw water influent is screened, chlorinated and fluoridated at Water Works Park before it is conveyed to Springwells. The low lift pumps lift the raw water for treatment through the process trains, which operate independently. The 1930 train provides hydraulic mixing through a baffled chamber for rapid mixing while the 1958 train has mechanical rapid mixers. Both trains have flocculation, sedimentation and filtration treatment units. A major project to upgrade the Springwells plant, SP-563, is currently underway and should be closed out in 2019. This project includes a complete replacement of the 1958 filters and a limited replacement of some of the 1930 filters. A laboratory upgrade, yard piping and other site improvements, and electrical improvements are also included in this project.

Figure VI-8. Springwells WTP

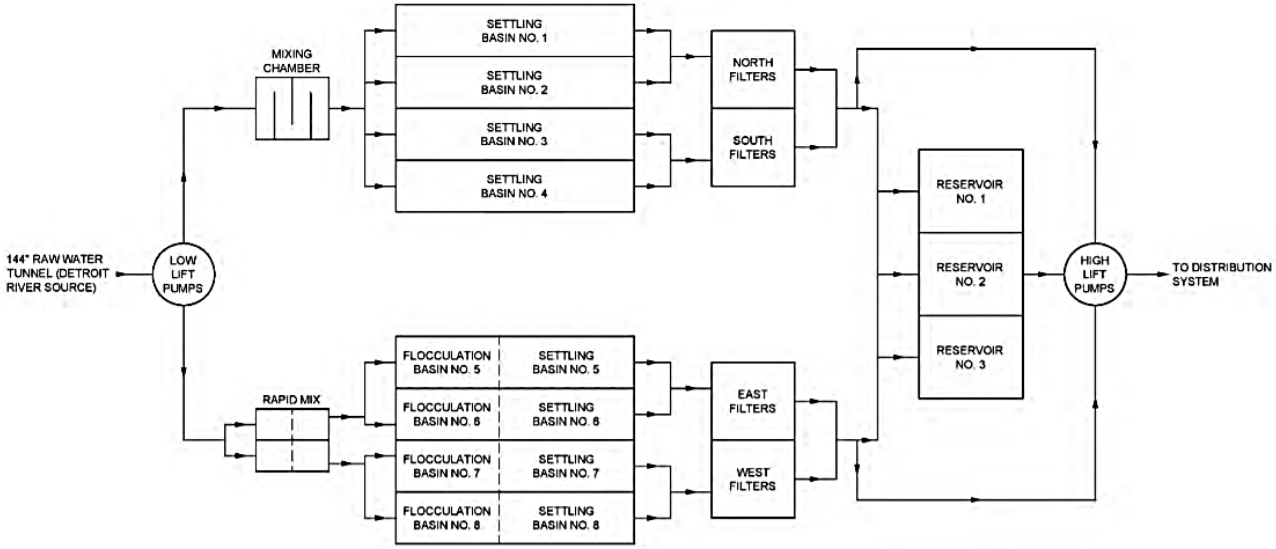


Figure VI-9. Springwells WTP process diagram

1.1.5. Water Works Park Water Treatment Plant

Water Works Park Water Treatment Plant can produce up to 240 million gallons of superior quality drinking water per day (MGD) with room for expansion to 320 MGD. The end result of the city's $275 million investment in this state-of-the-art facility is water the way it is meant to be: colorless, odorless, and great tasting; even better tasting than the water for which DWSD has been justifiably lauded for more than 150 years.

Figure VI-10. Water Works Park WTP

GLWA's newest water treatment plant is located at 10100 E. Jefferson Avenue in Detroit. Water Works Park II began operating in 2003 as a conventional surface water treatment plant. The original Water Works Park water treatment plant was razed and a new facility was constructed on the same site. The raw water source for the plant is the Belle Isle intake on the Detroit River. The plant has a maximum rated capacity of 240 MGD and is GLWA's first facility with ozone disinfection facilities, as well as a Residuals Handling Facility to treat filter backwash wastewater and alum sludge residuals. Water Works Park is the largest plant in Michigan to use ozone as a disinfectant. The plant was designed to use independent process trains - a minimum of two process units are provided for each treatment process. In addition, all conveyance facilities such as pipelines, junction chambers, channels, and wet wells are configured to provide a minimum of two treatment pathways.

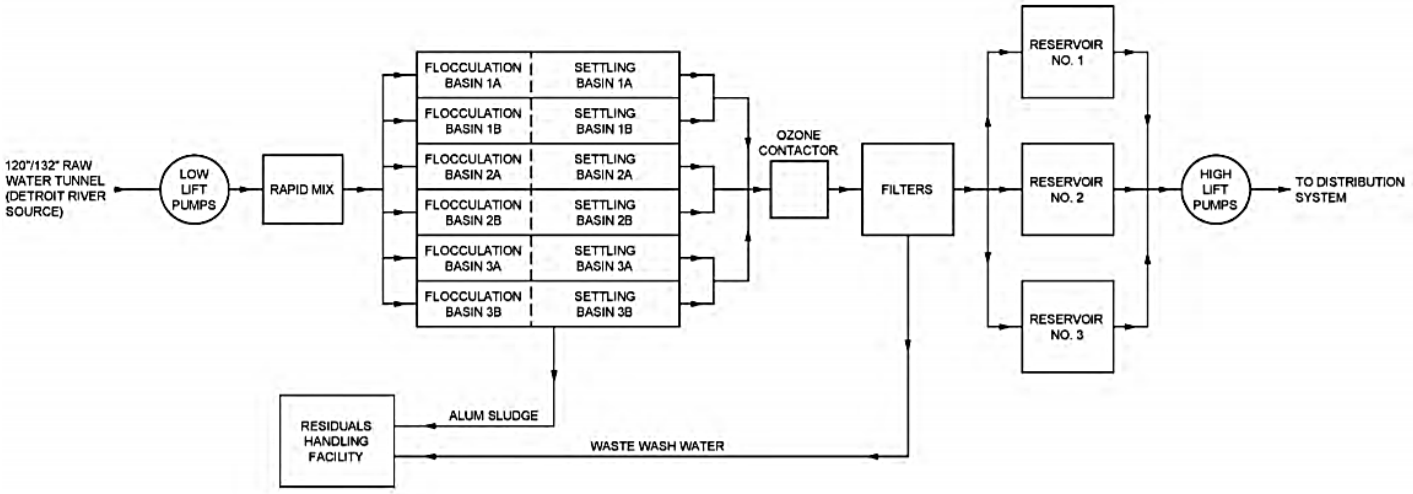


Figure VI-11. Water Works Park process diagram

1.1.6. General Purpose

Refer to the General Purpose description on page II-6.

1.2. Field Services

1.2.1. General Purpose

Refer to the General Purpose description on page II-6.

1.2.2. Transmission System

The Regional Water Transmission System (RWTS) consists of approximately 803 miles of water main typically 24-inch and greater with the responsibility for the transport of potable water from the five water treatment facilities to the regional wholesale water customer communities and the City of Detroit.

Figure VI-12, Figure VI-13, and Figure VI-14 depict the potable transmission main inventory by material, diameter, and decade installed/age, respectively. The RWTS ranges from 4 to 120 inch in diameter with an average age of 68 years. Additionally, there are approximately 23 miles of raw water transmission main ranging from 120 to 186 inch in diameter supplying the five water treatment plants from the three raw water intakes.

Most of RTWS is Prestressed Concrete Cylinder Pipe (54%), Cast Iron Pipe (19%), and Steel Pipe (17%). The majority of RTWS are typically 24 inches and larger, of which 24 inch (20%), 42 inch (15%), and 48 inch (13%) are the most common diameters; however, some smaller diameter pipe exists on site at the treatment and pumping facilities and limited areas of the system to maintain needed connectivity. Detroit and the region went through several growth periods of time evidenced by the greatest periods of water main installation of the 1960s (32%), 1920s (19%) and 1950s (11%).

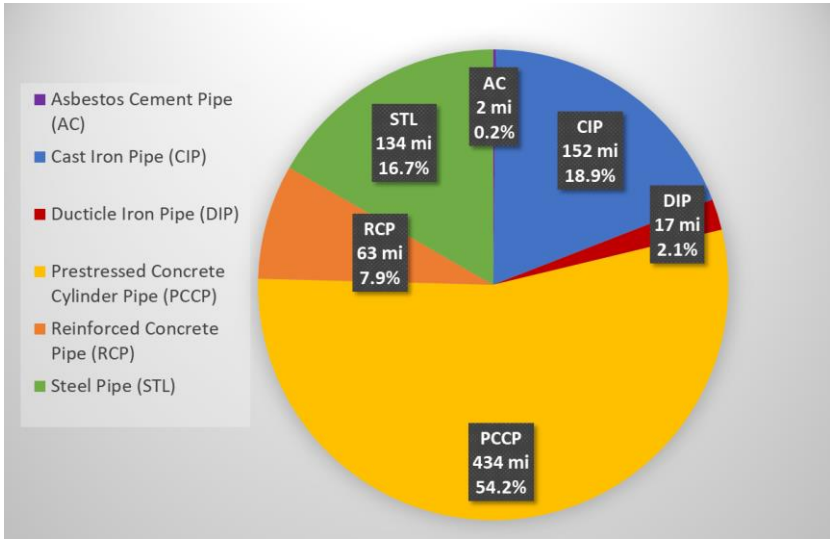


Figure VI-12. Transmission system inventory by material

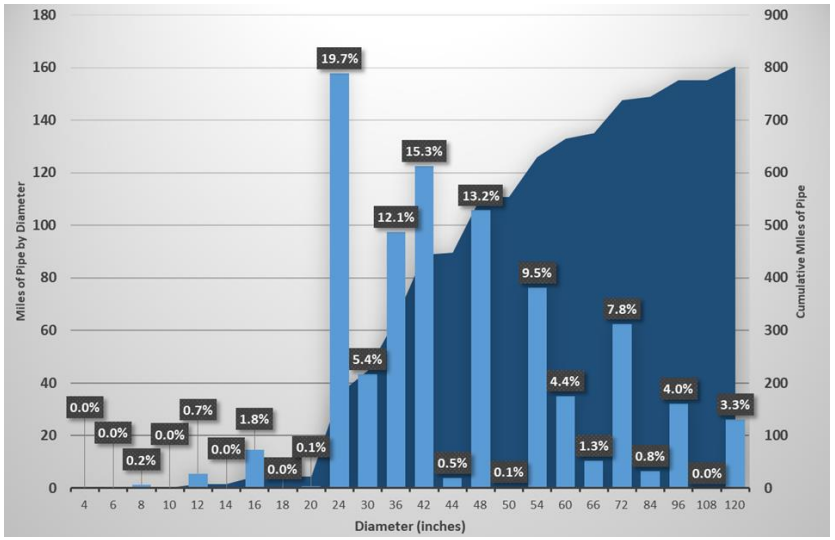


Figure VI-13. Transmission system inventory by diameter

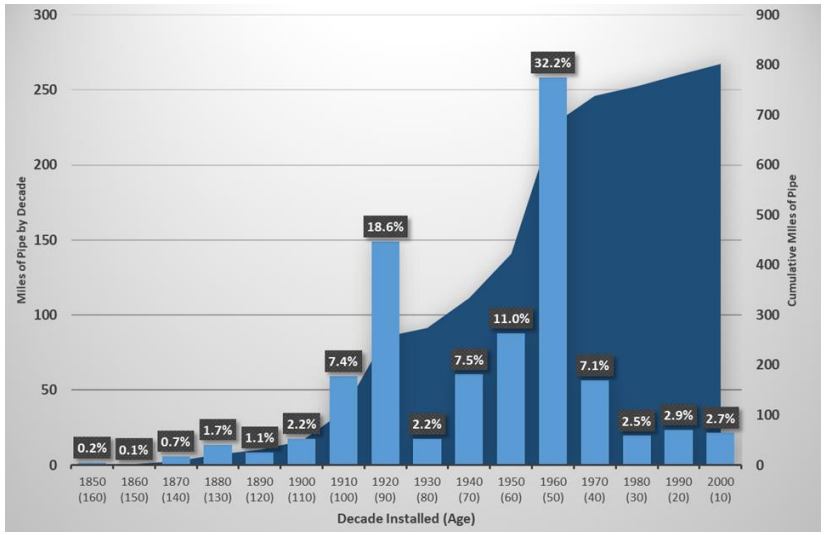


Figure VI-14. Transmission system inventory by decade installed / age

Recently, a prioritized condition assessment and renewal program is being developed. Refer to Figure VI-15 for a high-level process of the proposed transmission program. This effort was initiated to address the aging transmission system infrastructure in a proactive and methodic fashion. The focus of this project is to develop a risk-based prioritization and methodology for systematic water main inspection and renewal. Both probability and consequence of failure for all transmission mains are being considered to develop a data and risk-driven framework to inspect and renew the Authority's transmission system.

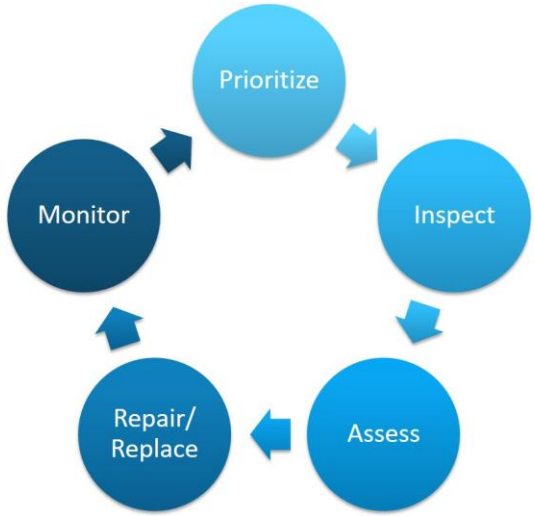


Figure VI-15. Proposed transmission system program cycle

Figure VI-18 depicts only those water transmission mains operated/maintained (leased) by GLWA within the City of Detroit. Figure VI-19 depicts the water transmission mains operated/maintained (leased) by GLWA over the entire service area. The suburban communities own, operate, and maintain all of their transmission and distribution systems from the points of connection to the RWTS.

1.3. Systems Control Center

1.3.1. General Purpose

Refer to the General Purpose description on page II-6.

Pressure Reducing Valve (PRV)

Pressure Reducing Valves (PRV) regulate water pressure at critical locations throughout the Regional Water Transmission System. Pressure reduction is needed to protect portions of the Water System from being impacted by above normal operating pressures. Downstream of the PRVs, pressure is maintained at a relatively consistent lower pressure.

Pressure Monitoring Site

Fifty-three Pressure Monitoring Sites in the transmission system provide suction/upstream and discharge/downstream pressure readings to aid in system operation.

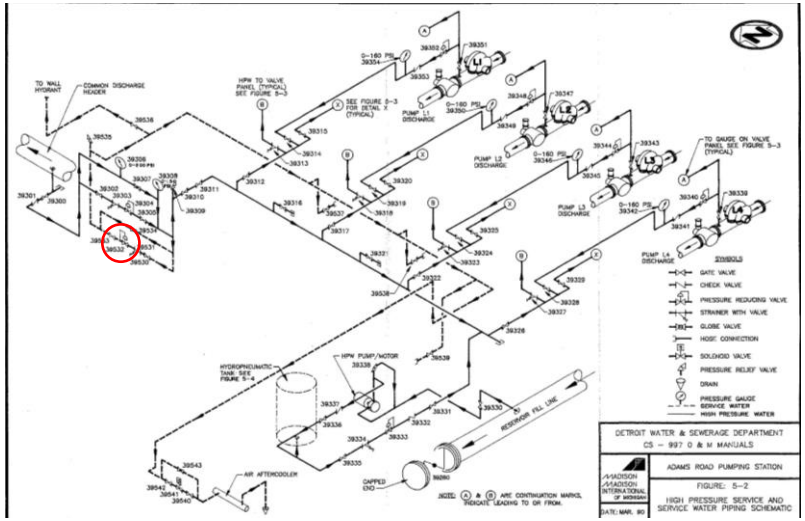


Figure VI-16. Adams Road Pumping Station: PRVs can be seen throughout drawing. The one circled for example reduces pressure before feeding to service water line.

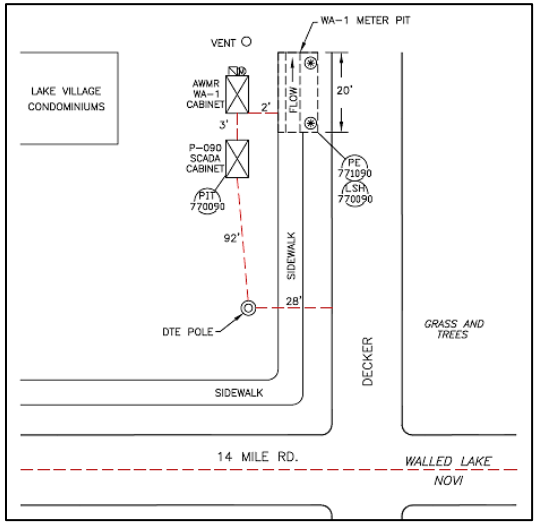


Figure VI-17. Pressure Monitoring Site at 14 Mile and Decker.

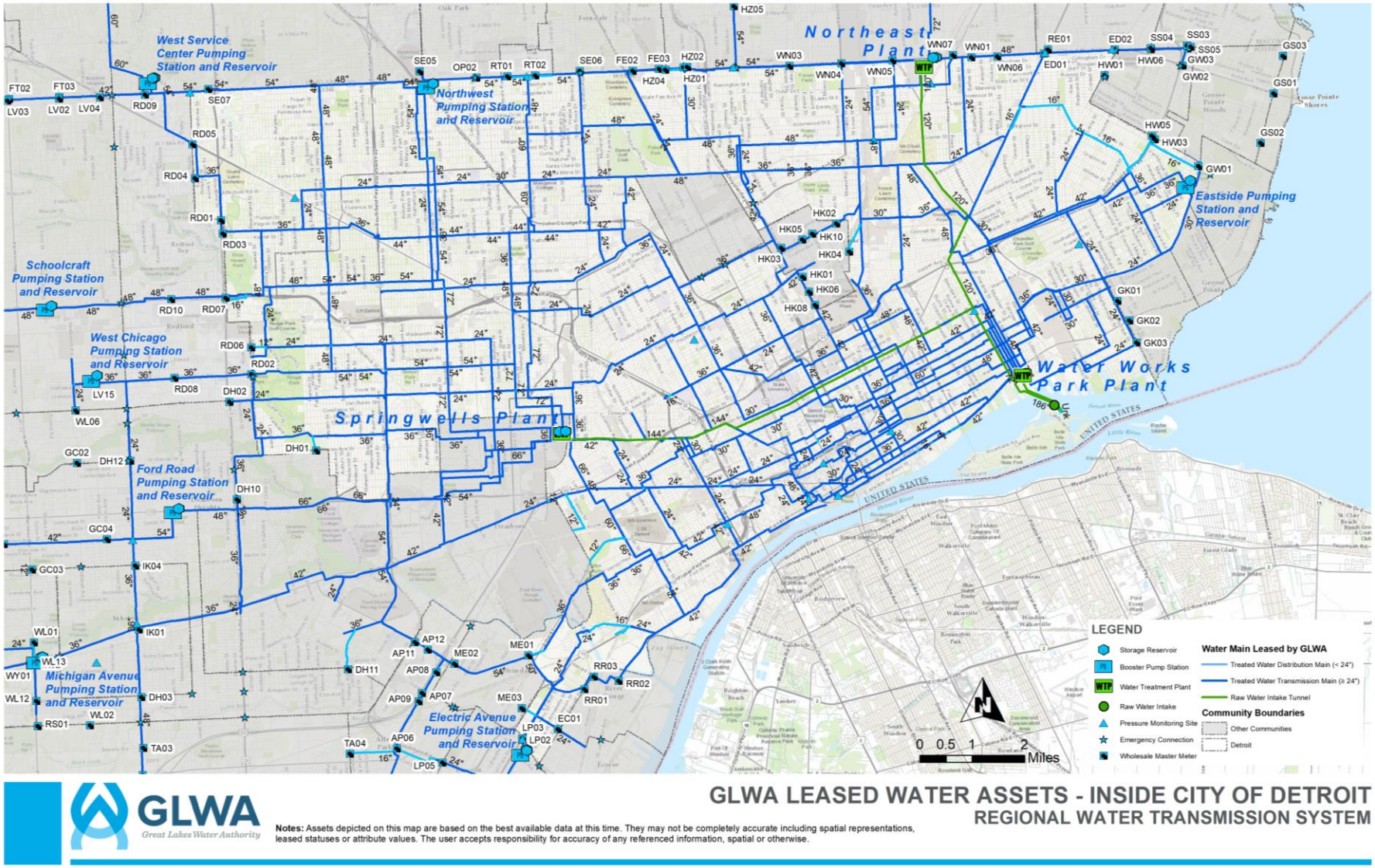


Figure VI-18. GLWA Leased Water Assets inside the City of Detroit

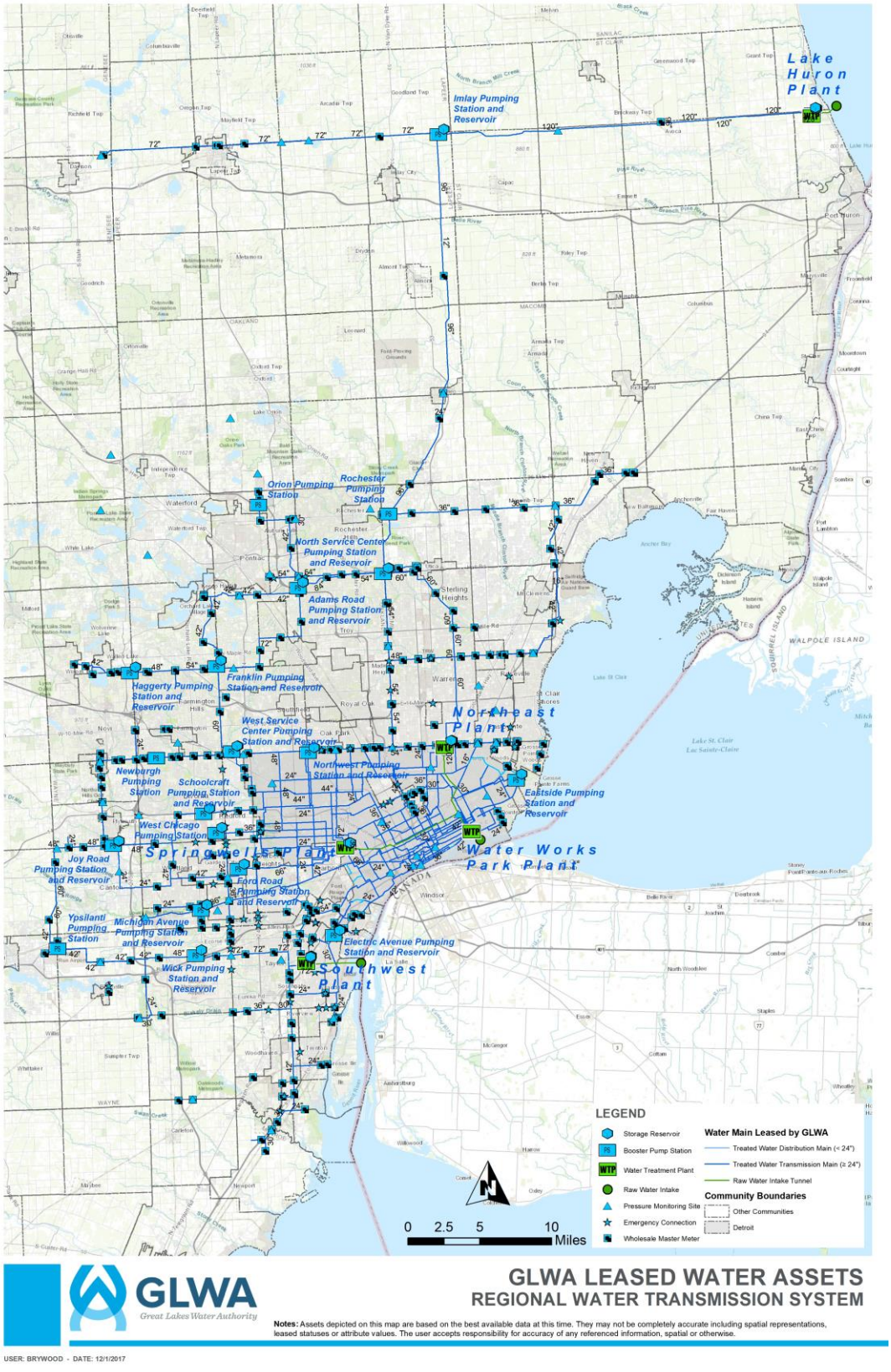


Figure VI-19 . GLWA Leased Regional Water Assets

Version 1 – Implementation schedule subject to change.

1.3.2. Pump Stations & Reservoirs

Water Booster Station

Booster stations are located within the regional System and distribute water received from the Water Treatment Facilities to communities and other stations to meet pressure and demand requirements. Some water is diverted to reservoirs at the station until needed during times of high demand. Pumping stations re-pump the water in transmission mains and reservoirs to maintain these pressures. There are 19 water booster stations in the GLWA transmission system.

Adams Road Pump Station

Figure VI-20. Adams Road Pump Station

The Adams Road Station consists of a pump house and a primary unit substation. The station's purpose is to increase the pressure in the 42-inch water main running along Adams Road. The station is fed by the North Service Center Station, which receives its water from the Lake Huron Water Treatment Plant through the Imlay Station. The discharged water from the station flows north through the 42-inch water main along Adams Road. The station serves the customer communities of Rochester Hills, Auburn Hills, Pontiac, as well as Bloomfield Hills and West Bloomfield, during high demand periods.

Elevation	881.50
Suction Pressure	40 - 55 psi
Discharge Pressure	120 -150 psi
Reservoir Capacity	10 MG
Reservoir Pumps	R1 - 1500 Hp, 10 MGD, 350 TDH R2 - 1500 Hp, 10 MGD, 350 TDH
Line Pumps	L1 - 750 Hp, 18.2 MGD, 191 TDH, VFD L2 - 750 Hp, 18.2 MGD, 191 TDH L3 - 750 Hp, 18.2 MGD, 191 TDH L4 - 750 Hp, 18.2 MGD, 191 TDH
Electric Feeds	2

Eastside Pump Station

Figure VI-21. Eastside Pump Station

The Eastside Pump Station consists of a pump house and a reservoir. The purpose of the station is to store water during the off-peak hours and use the stored water to supplement the supply during the hours of high demand. The discharged water from the station flows through the 36-inch water main along Canyon Avenue. The station serves the communities of East Detroit and Grosse Pointe.

Elevation	579.26
Suction Pressure	
Discharge Pressure	55 - 70 psi
Reservoir Capacity	10 MG
Reservoir Pumps	R1- 350 Hp, 10 MGD, 350 TDH R2- 350 Hp, 10 MGD, 350 TDH R3- 350 Hp, 10 MGD, 350 TDH
Electric Feeds	1

Electric Avenue Pump Station

Figure VI-22. Electric Avenue Pump Station

The Electric Avenue Pumping Station increases the water pressure in the 36-inch water main running along Electric Avenue. The station receives its water from the intermediate pressure district of the Southwest Water Treatment Plant. The station has two reservoirs in which it stores water to supplement the normal water supply during peak demand periods. During low demand periods, the station is used only to circulate the reservoir water once or twice per week. Water from Electric Avenue Pump Station serves the communities of Lincoln Park, Southgate, Riverview, and Trenton.

Elevation	577.71
Suction Pressure	55 - 70 psi
Discharge Pressure	55 - 80 psi
Reservoir Capacity	2 X 3.3 MG
Reservoir Pumps	R3 - 200 Hp, 5.56 MGD, 150 TDH R4 - 300 Hp, 5.56 MGD, 150 TDH
Line Pumps	L1 - 100 Hp, 5.04 MGD, 75 TDH L2 - 100 Hp, 5.04 MGD, 75 TDH
Electric Feeds	2

Haggerty Pump Station

Figure VI-23. Haggerty Pump Station

The Haggerty Pumping Station consists of a pump building, 10-million gallon aboveground reservoir, and exterior primary power area. The primary purpose of the station is to boost water pressure and increase flow to the existing water main. The station also has the capacity to provide an emergency supply of water of up to 28 MGD emergency demand in the event of a water main break between Haggerty and Franklin pumping stations. When operating at full capacity during periods of high demand, the Haggerty Pumping Station will boost the transmission system pressure in the existing 42-inch water main serving City of Novi, Commerce Township, City of Walled Lake, City of Wixom, West Bloomfield, and Wolverine Lake.

Elevation	880.00
Suction Pressure	55 - 100 psi
Discharge Pressure	80 - 105 psi
Reservoir Capacity	10 MG
Reservoir Pumps	R1 - 700 Hp, 14 MGD, 200 TDH R2 - 700 Hp, 14 MGD, 200 TDH
Line Pumps	L1 - 700 Hp, 21 MGD, 100 TDH, VFD L2 - 700 Hp, 21 MGD, 100 TDH, VFD L/R3 - 700 Hp, 21 MGD, 100 TDH, VFD
Electric Feeds	2

Ford Road Pump Station

Figure VI-24. Ford Road Pump Station

The Ford Road Station consists of a pump house and a reservoir that stores water to supplement the normal water supply during high demand periods. The station receives water from the intermediate district of the Springwells Water Treatment Plant. The station increases the pressure in the 48-inch water main running along Ford Road. Dearborn Heights, Garden City, Westland, Inkster, and parts of Canton Township are serviced by Ford Road Pump Station.

Elevation	618.26
Suction Pressure	35 - 50 psi
Discharge Pressure	75 - 95 psi
Reservoir Capacity	10 MG
Reservoir Pumps	R6 - 450 Hp, 10.08 MGD, 210 TDH R7 - 450 Hp, 10.08 MGD, 210 TDH R8 - 450 Hp, 10.08 MGD, 210 TDH R9 - 450 Hp, 10.08 MGD, 210 TDH R10 - 450 Hp, 10.08 MGD, 210 TDH
Line Pumps	L1 - 250 Hp, 18.14 MGD, 60 TDH L2 - 250 Hp, 10.08 MGD, 120 TDH L3 - 250 Hp, 10.08 MGD, 120 TDH L4 - 250 Hp, 10.08 MGD, 120 TDH L5 - 250 Hp, 10.08 MGD, 120 TDH
Electric Feeds	2

Franklin Pump Station

Figure VI-25. Franklin Pump Station

The Franklin Pumping Station consists of a pump house and reservoir. The station increases pressure in the 42-inch water main running north and the 54-inch water main running south along Inkster Road. The 60-inch main comes from the high pressure district of the West Service Center that, in turn, is fed by the Northeast and Springwells Water Treatment Plants. The station also stores water to supplement normal supply during the peak demand periods. The station serves Farmington Hills, Franklin Township, Bloomfield, and West Bloomfield.

Elevation	832.58
Suction Pressure	35 - 60 psi
Discharge Pressure	135 - 155 psi
Reservoir Capacity	10 MG
Reservoir Pumps	R1 - 1570 Hp, 22 MGD, 320 TDH R2 - 1570 Hp, 22 MGD, 320 TDH
Line Pumps	L1 - 2000 Hp, 30 MGD, 250 TDH L2 - 2000 Hp, 30 MGD, 250 TDH L3 - 2000 Hp, 30 MGD, 250 TDH L4 - 2000 Hp, 30 MGD, 250 TDH
Electric Feeds	2

Michigan Avenue Pump Station

Figure VI-26. Michigan Avenue Pump Station

The Michigan Avenue Pumping Station increases the water pressure in the 36-inch water main running along Michigan Avenue. The 36-inch water main is supplied by the intermediate pressure district of the Springwells Water Treatment Plant and when demand requires it, by the Southwest Water Treatment Plant intermediate pressure district. The station also stores water to supplement the normal water supply during peak demand periods. Water from Michigan Avenue Station serves the communities of Canton and Wayne.

Elevation	638.10
Suction Pressure	40 - 60 psi
Discharge Pressure	55 - 75 psi
Reservoir Capacity	2 X 3.5 MG
Reservoir Pumps	R4 - 350 Hp, 8.64 MGD, 150 TDH R5 - 350 Hp, 8.64 MGD, 150 TDH
Line Pumps	L1 - 75 Hp, 3.60 MGD, 90 TDH L2 - 75 Hp, 3.60 MGD, 90 TDH L3 - 125 Hp, 4.32 MGD, 110 TDH
Electric Feeds	2

Joy Road Pump Station

Figure VI-27. Joy Road Pump Station

The Joy Road Pumping Station consists of one pump house, two reservoirs, and one primary unit substation. The purpose of the station is to increase the pressure in the 48-inch water main running along Joy Road. The station is fed by the Ford Road and Schoolcraft stations, which are fed by the Springwells Water Treatment Plant. The discharged water from the station flows west through the 48-inch water main along Joy Road to Sheldon Road. Then, the water main runs north along Sheldon Road to Eight Mile in Northville. The station serves the customer communities of Plymouth and Northville and the townships of Plymouth, Northville, and Canton.

Elevation	686.00
Suction Pressure	35 - 55 psi
Discharge Pressure	130 - 150 psi
Reservoir Capacity	2 X 5 MG
Reservoir Pumps	R1 - 1200 Hp, 16.13 MGD, 332 TDH R2 - 1200 Hp, 16.13 MGD, 332 TDH R3 - 1250 Hp, 14.8 MGD, 332 TDH
Line Pumps	L1 - 1050 Hp, 15.84 MGD, 288 TDH, VFD L2 - 1050 Hp, 15.84 MGD, 288 TDH L3 - 1000 Hp, 14.8 MGD, 288 TDH
Electric Feeds	2

Imlay Pump Station

Figure VI-28. Imlay Pump Station

The Imlay Pumping Station consists of a pump house and reservoir. The station maintains the required water pressure in the 72-inch supply line to the Flint area and the 96-inch supply line to North Service Center Pumping Station. The station receives water through a 120-inch water main from the Lake Huron Water Treatment Plant. It also stores water to supplement the water supply during the high demand period. The supply water can bypass the station and go directly from the 120-inch main to the 96- and 72- inch water mains.

Elevation	787.87
Suction Pressure	65 - 95 psi
Discharge Pressure	85-w/-75-170-s psi
Reservoir Capacity	18 MG
Reservoir Pumps	R1 - 5250 Hp, 75 MGD, 335 TDH R2 - 5250 Hp, 75 MGD, 335 TDH
Line Pumps	LR3 - 6000 Hp, 75 MGD, 335 TDH, VFD LR4 - 6000 Hp, 70 MGD, 390 TDH LR5 - 6000 Hp, 70 MGD, 390 TDH LR6 - 6000 Hp, 70 MGD, 390 TDH, VFD LR7 - 6000 Hp, 70 MGD, 390 TDH, VFD LR8 - 6000 Hp, 70 MGD, 390 TDH, VFD
Electric Feeds	2

Newburgh Pump Station

Figure VI-29. Newburgh Pump Station

The Newburgh Pumping Station increases the pressure in the 42-inch water main that runs along Eight Mile from West Service Center intermediate pressure line. This main is fed by the high pressure district of the Northeast and Springwells Water Treatment Plants. Discharged water from the station flows west through the 42-inch water main and serves Livonia, Northville, Novi, and Farmington Hills.

Elevation	737.00
Suction Pressure	30 - 60 psi
Discharge Pressure	110 - 130 psi
Line Pumps	L1 - 450 Hp, 8 MGD, 200 TDH L2 - 450 Hp, 8 MGD, 200 TDH L3 - 515 Hp, 12 MGD, 200 TDH L4 - 515 Hp, 12 MGD, 200 TDH L5 - 515 Hp, 12 MGD, 200 TDH
Electric Feeds	2

Northwest Pump Station

Figure VI-30. Northwest Pump Station

The Northwest Pumping Station consists of a pump house and a reservoir. The station stores water during the off-peak hours and uses the stored water to supplement the water supply during the hours of high demand. The discharged water from the station flows north, through the 42-inch discharge header along Greenfield Road, to the Southeastern Oakland County Water Association Pump Station. A 24-inch branch line, running south along Greenfield Road, supplies water to the Springwells high pressure district. A 54-inch branch line, running west along Eight Mile, supplies water to the West Service Center. The station serves the communities of northwest Detroit.

Elevation	657.00
Suction Pressure	
Discharge Pressure	40-55 psi
Reservoir Capacity	10 MG
Reservoir Pumps	R1 - 350 Hp, 10.08 MGD, 150 TDH R2 - 350 Hp, 10.08 MGD, 150 TDH R3 - 350 Hp, 10.08 MGD, 150 TDH R4 - 350 Hp, 10.08 MGD, 150 TDH R5 - 350 Hp, 10.08 MGD, 150 TDH
Electric Feeds	1

North Service Center

Figure VI-31. North Service Center

The North Service Center receives its water from Lake Huron Water Treatment Plant through the Imlay Station. North Service Center maintains adequate pressure in the 84-inch water main supplying Pontiac and Utica, supplies water to the service are of Northeast Water Treatment Plant and to Eight Mile water main, and stores water during low demand periods to be used to supplement normal water supply during peak periods. North Service Center serves Pontiac, Adams Pumping Station, Utica, Northeast Water Treatment Plant service area, and supplies water to the Eight Mile water main.

Elevation	697.70
Suction Pressure	30 - 50 psi
Discharge Pressure	135 - 150 psi
Reservoir Capacity	2 X 10 MG
Reservoir Pumps	R1 - 250 Hp, 15 MGD, 75 TDH R2 - 250 Hp, 15 MGD, 75 TDH R3 - 350 Hp, 20 MGD, 76 TDH R4 - 350 Hp, 20 MGD, 76 TDH
Line Pumps	L2 – 2500/1250 Hp, 23-30 MGD, 240-370 TDH L3 – 2500/1250 Hp, 19.3-25.5 MGD, 260-400 TDH L4 – 2500/1250 Hp, 23-30 MGD, 240-370 TDH L5 – 2500/1250 Hp, 19.3-25.5 MGD, 260-400 TDH L6 - 2500/1250 Hp, 19.3-25.5 MGD, 260-400 TDH L7 - 2500 Hp, 30 MGD, 370 TDH, VFD L8 - 2500 Hp, 30 MGD, 370 TDH, VFD L9 - 2500 Hp, 30 MGD, 370 TDH, VFD L10 - 2500 Hp, 30 MGD, 370 TDH, VFD
Electric Feeds	3

Orion Pump Station

Figure VI-32. Orion Pump Station

The Orion Station supplies water at an adequate pressure to Orion's distribution mains. The water comes though the northbound 42-inch water main from Adams Station or North Service Center's 54-inch main, which, in turn, is fed by the Lake Huron Water Treatment Plant through the Imlay Pumping Station. The discharge from the station flows though the 30-inch water main running long Giddings Road and serves the Orion area.

Elevation	946.25
Suction Pressure	75 - 95 psi
Discharge Pressure	105 - 130 psi
Line Pumps	L1 – 75 Hp, 2 MGD, 85 TDH L2 – 75 Hp, 4 MGD, 85 TDH L3 – 75 Hp, 4 MGD, 85 TDH L4 – 75 Hp, 4 MGD, 85 TDH
Electric Feeds	2

Rochester Pump Station

Figure VI-33. Rochester Pump Station

The Rochester Pump Station consists of a pump house and a transformer yard. The station supplies water at an adequate pressure to the City of Rochester Hills and Shelby Township distribution mains. The station replaced a temporary station at the site. It is fed by the Imlay Station, which receives its water from the Lake Huron Water Treatment Plant. Discharged water will boost pressures in communities currently being served by a 36-inch main running east-west along 24 Mile. The station serves City of Rochester Hills, Shelby Township, City of Rochester, Lennox Township, Macomb Township, and Chesterfield Township.

Elevation	687.00
Suction Pressure	65 - 95 psi
Discharge Pressure	75 - 140 psi
Line Pumps	L1 - 700 Hp, 14.4 MGD, 205 TDH, VFD L2 - 700 Hp, 14.4 MGD, 205 TDH L3 - 700 Hp, 14.4 MGD, 205 TDH, VFD L4 - 700 Hp, 14.4 MGD, 205 TDH L5 - 700 Hp, 14.4 MGD, 205 TDH
Electric Feeds	2

West Service Center

Figure VI-34. West Service Center

The West Service Center consists of one main pump house, two reservoir pump houses, and two reservoirs. It increases the pressure in the 54-inch water main running along Eight Mile Road, from the high pressure district of the Northeast and Springwells Plants. There are six line pumps in the main pump house. Three line pumps supply high pressure water to the Franklin station and other upstream customer communities. The three remaining pumps supply the intermediate pressure line, which serves the Newburgh Station, Farmington Station, and other upstream communities. During low demand periods, water is diverted to the reservoirs. During high demand periods, the reservoir water is pumped to the suction header of the line pumps. The intermediate pressure line running along Eight Mile serves Redford Township and Livonia before reaching the Newburgh Station. High pressure lines running along Inkster Road serve the Farmington Hills and Southeast Oakland County Water Association before reaching the Franklin Station.

Elevation	646.89
Suction Pressure	35 - 50 psi
Discharge Pressure	110 - 140 psi
Reservoir Capacity	2 X 10 MG
Reservoir Pumps	R1 - 400 Hp, 24 MGD, 96 TDH R2 - 400 Hp, 24 MGD, 96 TDH R3 - 400 Hp, 20 MGD, 85 TDH R4 - 400 Hp, 20 MGD, 85 TDH
Line Pumps	L1 - 700 Hp, 30 MGD, 110 TDH L2 - 700 Hp, 30 MGD, 110 TDH L3 - 700 Hp, 30 MGD, 110 TDH L4 - 1250 Hp, 28.8 MGD, 188 TDH L5 - 1250 Hp, 29.5 MGD, 188 TDH L5 - 1250 Hp, 29.5 MGD, 188 TDH
Electric Feeds	2

Schoolcraft Pump Station

Figure VI-35. Schoolcraft Pump Station

The Schoolcraft Pump Station consists of one pump house, an electrical building, one reservoir, and one primary unit substation. The station increases the pressure in the 48-inch water main running along Schoolcraft Road. The station is fed by the Springwells Water Treatment Plant and itself feeds the Joy Road Station. The station serves the City of Livonia and interconnects with the Joy Road Station, which services Canton, Westland, and Plymouth.

Elevation	626.83
Suction Pressure	35 - 55 psi
Discharge Pressure	80 - 110 psi
Reservoir Capacity	10 MG
Reservoir Pumps	R1 - 1200 Hp, 20 MGD, 238 TDH R2/L3 - 1200 Hp, 20 MGD, 238 TDH, VFD
Line Pumps	L1 - 1000 Hp, 20 MGD, 170 TDH, VFD L2 - 1000 Hp, 20 MGD, 170 TDH, VFD
Electric Feeds	2

West Chicago Pump Station

Figure VI-36. West Chicago Pump Station

The West Chicago Station increases the water pressure in the 26-inch water main running along West Chicago Road. The 36-inch water main comes from the high pressure district of the Springwells Water Treatment Plant. The station helps increase the pressure in the intake lines for Schoolcraft and Newburgh Stations. Water from the station serves the customer communities of southern Livonia, West Service Center intermediate district, and Westland.

Elevation	636.71
Suction Pressure	40 - 60 psi
Discharge Pressure	70 - 80 psi
Reservoir Pumps	R4 - 300 Hp, 7.2 MGD, 185 TDH R5 - 300 Hp, 7.2 MGD, 185 TDH R6 - 300 Hp, 7.2 MGD, 185 TDH
Line Pumps	L1 - 300 Hp, 7.4 MGD, 180 TDH L2 - 300 Hp, 7.4 MGD, 180 TDH L3 - 125 Hp, 4.3 MGD, 180 TDH
Electric Feeds	2

Wick Road Pump Station

Figure VI-37. Wick Road Pump Station

The Wick Road Station consists of a pump house, a reservoir, and an electrical building. The station increases pressure in the 48-inch water main running along Wick Road. The station is fed mainly by the Southwest Water Treatment Plant, which is affected by the Springwells Plant's intermediate pressure line. The discharged water from the station flows west through the 48-inch water main along Wick Road. The main is reduced to 42 inches and feeds the Ypsilanti Station. A 24-inch branch from the 48-inch main serves the Van Buren, Sumpter, Huron, and Ash Townships. The station serves the customer communities of Romulus, Belleville, Carleton, Wayne, and Ypsilanti.

Elevation	626.83
Suction Pressure	40 - 60 psi
Discharge Pressure	80 - 135 psi
Reservoir Capacity	10 MG
Reservoir Pumps	R1 - 1000 Hp, 12 MGD, 238 TDH R2 - 1000 Hp, 12 MGD, 238 TDH R3/L3 - 1000 Hp, 12 MGD, 238 TDH, VFD
Line Pumps	L1 - 1000 Hp, 18 MGD, 252 TDH, VFD L2 - 1000 Hp, 18 MGD, 252 TDH, VFD
Electric Feeds	2

Ypsilanti Pump Station

Figure VI-38. Ypsilanti Pump Station

The Ypsilanti Station consists of a pump house and a transformer yard. The station supplies water at adequate pressure to the City of Ypsilanti's distribution mains. It is fed by the Wick Road Station which receives its water from the Southwest Water Treatment Plant's intermediate pressure line. Discharged water from the station flows through the 42-inch water main running along Old Ecorse Road. It serves the City of Ypsilanti as well as Augusta, Pittsfield, and Superior.

Elevation	703.90
Suction Pressure	30 - 60 psi
Discharge Pressure	110 - 130 psi
Line Pumps	L1 - 1000 Hp, 18 MGD, 250 TDH, VFD L2 - 1000 Hp, 18 MGD, 250 TDH, VFD L3 - 1000 Hp, 18 MGD, 250 TDH, VFD
Electric Feeds	2

1.4. Water Quality

The Water Quality Group is responsible for the majority of the testing and reporting of water quality throughout the Water System. The Water Quality Group manages the state and federal rules and their application to the entire Water System. Functions include the collection, monitoring and reporting requirements associated with these rules. Total coliform rule (TCR), the consumer confidence rule (CCR) and the lead and copper (LCR) are exclusively managed by the GLWA water quality group for the entire System except in those communities which choose not to participate. The Safe Drinking Water Act (SDWA) rules that apply exclusively to the distribution system, other than TCR and LCR, are the exclusive responsibility of each local water system.

Currently the GLWA Water Quality Group performs a majority of its work for the overall benefit of the GLWA System. These functions include water quality testing, customer response, disinfection services and the overall program management related to the Water System water quality compliance.

1.4.1. General Purpose

Refer to the General Purpose description on page II-6.

1.5. Metering

The System Analytics and Meter Operations Group is responsible for maintenance and operation of numerous remote assets used in the metering of water, as well as the communication network used to transmit data from the water metering locations to the head end.

The System Analytics and Meter Operations Group maintains assets with the responsibility to meter wholesale water usage at 290 metering sites. Each of the 290 water metering sites contain equipment that is located in a control cabinet, as well as assets that are located in a water meter vault. The assets that are housed in the control cabinet include Remote Terminal Units, radios, batteries, battery chargers and flow transmitters. The assets that are housed in the water meter vault include differential pressure transmitters, venturi tubes, magnetic meters, pressure transmitters, mechanical flow meters, bypass valves, inlet/outlet gate valves, butterfly valves, and sump pumps.

In addition to metering equipment, the System Analytics and Meter Operations Group maintains a 900MHz telemetry network and a Wholesale Automated Meter Reading (WAMR) system. The 900 MHz telemetry network is composed of 445 repeater sites. Each repeater location consists of radios and antennas. The WAMR system collects flow and pressure information from GLWA wholesale water meter sites every five minutes. The portal provides a customizable, web-based interface that displays meter and customer data in both graphical and tabular formats in increments of five minute, hourly and daily intervals. Customer and site usage can also be downloaded for off-line examination. Billed Consumption with adjustments can be reviewed for customer usage analysis.

1.5.1. General Purpose

Refer to the General Purpose description on page II-6.

1.6. General Purpose

Refer to the General Purpose description on page II-6.

1.7. Programs

Refer to the Programs description on page II-6.

SECTION 2 WASTEWATER

All financial figures are in thousands of dollars ($1,000's). In the Capital Expense Category (CapEx Category), projects are funded with Construction Bonds (CB) or the Improvement & Extension Fund (IE). Cost Allocation has been listed as Common-to-All (CTA) or Industrial Waste Control (IWC), or CSO 83/17, as explained in Chapter III. Projects in the "Centralized Services" category (CIP number begins with 3) but funded by the wastewater CIP are listed in the Centralized Services section.

Table VI-4. Wastewater/Sewer Projects

CIP #	Title	Year Added	CapEx Category	Cost Allocation	Lifetime Actual Thru FY 2017 (unaudited)	Projected Expenditures							2018-2022 CIP Total	Project Total	Percent of W/S CIP
						FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond			
211001	WRRF Rehabilitation of Primary Clarifiers Rectangular Tanks, Drain Lines, Electrical/Mechanical Building and Pipe Gallery	1999	CB	CTA	10,243	12,518	22,983	9,002	0	0	0	0	31,985	54,746	4.1%
211002	WRRF PS No. 2 Pumping Improvements - Phase 1	2003	CB	CTA	109	678	3,629	0	0	0	0	0	3,629	4,416	0.5%
211003	WRRF Rehabilitation of Primary Clarifiers	2006	CB	CTA	1,702	250	235	0	0	0	0	0	235	2,187	0.0%
211004	WRRF PS #1 Rack & Grit and MPI Sampling Station 1 Improvements	2008	CB	CTA	20,944	4,922	1,819	0	0	0	0	0	1,819	27,685	0.2%
211005	WRRF PS No. 2 Improvements Phase II	2014	CB	CTA	0	5	495	110	8,955	8,775	2,455	709	20,790	21,504	2.7%
211006	WRRF PS No. 1 Improvements	2016	CB	CTA	0	160	770	4,230	9,490	9,270	1,204	368	24,964	25,492	3.2%
211007	WRRF PS #2 Bar Racks Replacements and Grit Collection System Improvements	2016	CB	CTA	0	5	385	1,830	2,385	6,705	6,705	1,793	18,010	19,808	2.3%
211008	WRRF Rehabilitation of Ferric Chloride Feed System in PS-1 and Complex B Sludge Lines	2017	CB	CTA	0	5	110	1,210	2,631	5,337	2,279	0	11,567	11,572	1.5%
211009	WRRF Rehabilitation of the Circular Primary Clarifier Scum Removal System	2017	CB	CTA	0	0	0	5	825	550	5,588	4,825	6,968	11,793	0.9%
212001	WRRF Returned Activated Sludge (RAS) Pumps, Influent Mixed Liquor System and Motor Control Centers (MCC) Improvements for Secondary Clarifiers	2005	CB	CTA	34,090	0	0	0	0	0	0	0	0	34,090	0.0%
212002	WRRF Study, Design, & Construction Management Services for Modified Detroit River Outfall No. 2	2006	CB	CTA	10,819	0	0	0	0	0	0	0	0	10,819	0.0%
212003	WRRF Aeration System Improvements	2008	CB	CTA	3,805	11,083	3,587	0	0	0	0	0	3,587	18,475	0.5%
212004	WRRF Chlorination and Dechlorination Process Equipment Improvements	2010	CB	CTA	86	1,090	3,270	636	0	0	0	0	3,906	5,082	0.5%
212005	WRRF Rouge River Outfall No. 2 (RRO-2) Segment 1	2011	CB	CTA	252	0	0	0	0	0	0	0	0	252	0.0%
212006	WRRF Rouge River Outfall (RRO) Disinfection (Alternative)	2014	CB	CTA	6,873	20,493	18,139	1,798	0	0	0	0	19,937	47,303	2.5%
212007	WRRF Rehabilitation of the Secondary Clarifiers	2017	CB	CTA	0	0	0	825	1,320	3,545	8,885	18,970	14,575	33,545	1.9%

CIP #	Title	Year Added	CapEx Category	Cost Allocation	Lifetime Actual Thru FY 2017 (unaudited)	Projected Expenditures									
						FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond	2018-2022 CIP Total	Project Total	Percent of W/S CIP
212008	WRRF Rehabilitation of Intermediate Lift Pumps (ILPs)	2017	CB	CTA	0	0	220	1,097	6,330	5,560	5,626	939	18,833	19,772	2.4%
213001	WRRF Replacement of Belt Filter Presses for Complex I and Upper Level Complex II	2006	CB	CTA	36,669	0	0	0	0	0	0	0	0	36,669	0.0%
213002	WRRF Rehabilitation of Central Offload Facility	2010	CB	CTA	202	639	6,215	7,250	4,415	0	0	0	17,880	18,721	2.3%
213003	WRRF Sewage Sludge Incinerator Air Quality Improvements	2012	CB	CTA	50,635	1,025	0	0	0	0	0	0	0	51,660	0.0%
213004	WRRF Biosolids Dryer Facility	2012	CB	CTA	2,024	300	300	0	0	0	0	0	300	2,624	0.0%
213005	WRRF Complex I Incinerators Decommissioning and Reusability	2014	CB	CTA	0	0	0	0	154	1,178	2,268	1,129	3,600	4,729	0.5%
213006	WRRF Improvements to Sludge Feed Pumps at Dewatering Facilities	2016	CB	CTA	4	0	0	55	264	2,306	1,090	0	3,715	3,719	0.5%
213007	WRRF Modification to Incinerator Sludge Feed Systems at Complex -II	2016	CB	CTA	0	7,035	10,999	3,352	0	0	0	0	14,351	21,386	1.8%
213008	WRRF Rehabilitation of the Ash Handling Systems	2017	CB	CTA	0	0	0	660	880	3,470	5,851	8,995	10,861	19,856	1.4%
213009	WRRF Phosphorous Recovery Evaluation	2017	I&E	CTA	0	0	0	0	0	0	0	0	0	0	0.0%
214001	WRRF Relocation of Industrial Waste Control Division and Analytical Laboratory Operations	2014	CB	IWC	182	0	5,767	6,540	0	0	0	0	12,307	12,489	1.6%
216001	Underground Electrical Duct Bank Repair and EB-1, EB-2 and EB-10 Primary Power Service Improvements	1998	CB	CTA	31,636	3,550	0	0	0	0	0	0	0	35,186	0.0%
216002	Plant-wide Fire Alarm Systems Upgrade/ Integration and Fire Protection Improvements	2004	CB	CTA	850	0	0	0	0	0	0	0	0	850	0.0%
216004	Rehabilitation of Various Sampling Sites and PS#2 Ferric Chloride System at WRRF	2010	CB	CTA	312	570	3,815	545	0	0	0	0	4,360	5,242	0.6%
216005	Rehabilitation of the Main Plant Maintenance Building & Other Maintenance Areas and Improvement of Work Environment	2011	CB	CTA	0	0	0	0	605	605	3,429	13,300	4,639	17,939	0.6%
216006	Rehabilitation of Potable Water, Screened Final Effluent (SFE), Natural Gas, Secondary Water System and Compressed Air Pipelines & SFE Pump Station	2017	CB	CTA	0	0	0	1,650	3,850	6,916	16,900	23,165	29,316	52,481	3.7%
216007	DTE Primary Electric 3rd Feed Supply to WRRF	2017	CB	CTA	15	0	3,225	3,225	0	0	0	0	6,450	6,465	0.8%
222001	Oakwood District Intercommunity Relief Sewer Modification at Oakwood District	2014	CB	CTA	0	0	600	13,200	12,700	11,500	0	0	38,000	38,000	4.8%
222002	Detroit River Interceptor (DRI) Evaluation and Rehabilitation	2016	CB	CTA	5	2,222	11,569	6,600	0	0	0	0	18,169	20,396	2.3%
222003	North Interceptor East Arm (NIEA) Evaluation and Rehabilitation	2016	CB	OMID	0	0	11,000	12,000	3,000	0	0	0	26,000	26,000	3.3%

CIP #	Title	Year Added	CapEx Category	Cost Allocation	Lifetime Actual Thru FY 2017 (unaudited)	Projected Expenditures							2018-2022 CIP Total	Project Total	Percent of W/S CIP
						FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond			
222004	Collection System Valve Remote Operation Structure Improvements	2017	CB	CTA	0	341	1,013	1,010	0	0	0	0	2,023	2,364	0.3%
222005	Collection System Access Hatch Improvements	2017	CB	CTA	0	0	0	0	0	0	0	0	0	0	0.0%
222007	NIEA Evaluation and Rehabilitation from WRRF to Gratiot Ave. and Sylvester St.	2017	CB	CTA	0	0	6,969	6,969	6,969	0	0	0	20,907	20,907	2.7%
232001	Fairview Pumping Station - Replace Four Sanitary Pumps	2011	CB	CTA	778	500	12,090	14,410	3,970	0	0	0	30,470	31,748	3.9%
232002	Freud & Conner Creek Pump Station Improvements	2016	CB	CTA	2,101	5,586	5,584	8,297	250	0	0	0	14,131	21,818	1.8%
232003	Northeast Pumping Station	2016	CB	OMID	0	0	2,408	10,920	13,000	0	0	0	26,328	26,328	3.4%
233001	Collection System Backwater Gates and Regulator Gates Rehabilitation	2017	CB	CTA	0	0	0	0	0	0	0	0	0	0	0.0%
233002	Collection System In System Storage Devices (ISDs) Improvement	2017	CB	CTA	0	83	446	1,991	996	0	0	0	3,433	3,516	0.4%
251002	Wastewater System-Wide Instrumentation & Control Software and Hardware Upgrade	2017	CB	CTA	0	0	842	2,557	6,760	3,380	0	0	13,539	13,539	1.7%
260100	WRRF, Lift Station and Wastewater Collection System Structures Allowance	2012	CB	CTA	14,758	5,428	10,920	12,010	10,920	13,100	12,000	0	58,950	79,136	7.5%
260200	Sewer and Interceptor Evaluation and Rehabilitation Program	2013	CB	CTA	3,397	10,001	8,484	21,060	20,000	17,058	0	0	66,602	80,000	8.5%
260300	Scheduled Replacement Program of Critical Assets	2016	CB	CTA	56	2,751	6,000	6,000	6,000	6,000	6,000	0	30,000	32,807	3.8%
260400	Sewage Meter Design, Installation, Replacement and Rehabilitation Program	2014	CB	CTA	0	500	1,700	1,700	1,700	1,000	1,000	1,000	7,100	8,600	0.9%
260500	CSO Outfall Rehabilitation	2017	CB	CTA	0	7,471	11,960	11,961	8,969	5,973	5,973	0	44,836	52,307	5.7%
260600	CSO FACILITIES IMPROVEMENT PROGRAM	2017	CB	83/17	764	1,598	11,699	6,497	14,850	26,950	17,450	2,450	77,446	82,258	9.9%

2.1. Water Resources Recovery Facility

The Water Resources Recovery Facility (WRRF, formerly referred to as the Wastewater Treatment Plant or WWTP) is the largest single-site wastewater treatment facility in the United States. Of the more than $22.5 million spent to ready the plant for its February 1940 startup, $10 million was spent on plant construction with the balance going to complete the network of huge interceptor sewers through which a combined stream of storm and sanitary wastewater flows to the plant from customer communities throughout metro Detroit.

The treatment plant was originally designed to provide primary treatment (screening, grit removal, primary sedimentation and chlorination) for the wastewater generated by 2.4 million people and, with modifications, as many as 4 million people. The plant's service area in 1940 included Detroit and 11 nearby suburban communities. Secondary treatment (biological treatment and secondary clarification for removal of biodegradable solids, resulting in an even cleaner effluent) was introduced in the 1960s. GLWA's WRRF continues to be the recipient of continual upgrades in order to ensure it is capable of staying abreast of ever more stringent regulatory standards.

Currently, the WRRF services the needs of 35 percent of the state's population contained within Detroit and 76 other communities in a service area of more than 946 square miles. In 1999, the Michigan section of the American Society of Civil Engineers named the WRRF one of the top 10 engineering projects of the 20th century.

The WRRF treats, on average, 650 MGD. Currently, the peak rated capacity is 1,700 MGD for primary treatment and 930 MGD for secondary treatment. The WRRF has been in service since 1940, at which time it removed approximately 50-70 percent of the pollutant loads. It was upgraded to full secondary treatment in the 1970s. After the upgrade to secondary treatment, the WRRF removes in excess of 85 percent of the pollutant loads to meet federal and state requirements.

Currently, the WRRF serves approximately 3 million residents in southeast Michigan. The WRRF receives wastewater flow from three main interceptors: the Detroit River Interceptor (DRI), the Oakwood Interceptor (OWI), and the North Interceptor East Arm (NIEA). Approximately 36 percent of the flow comes from the DRI, 35 percent from the OWI, and the remaining 29 percent from the NIEA. After the flow reaches the WRRF via the three interceptors, it is pumped to the primary and secondary treatment processes at Pump Station No. 1 (PS-1) and Pump Station No. 2 (PS-2). Each pump station has eight pumps with a combined total pumping capacity in excess of 2 billion gallons per day (BGD).

A diagram of the WRRF layout is shown on the following page in Figure VI-39.

2.1.1. Primary Treatment

The primary treatment area of the WRRF consists of the following major units:

- Raw wastewater pumping to Pump Station No. 1 (PS-1) and Pump Station No. 2 (PS-2), grit and screenings removal, and chemical addition.
- 12 Rectangular Primary Clarifiers
- 6 Circular Clarifiers
- 7 Rectangular Clarifier Scum Buildings
- 6 Circular Clarifier Scum Buildings
- Rectangular Clarifier Pipe Gallery (including 12 Sludge Pumps)
- 6 Rectangular Clarifier Electrical/Mechanical Buildings
- 3 Circular Clarifier Sludge Pumping Stations
- 1 Scum Concentrator Building
- 1 Thin Sludge Pumping Station
- Miscellaneous Hydraulic Structures and Gates

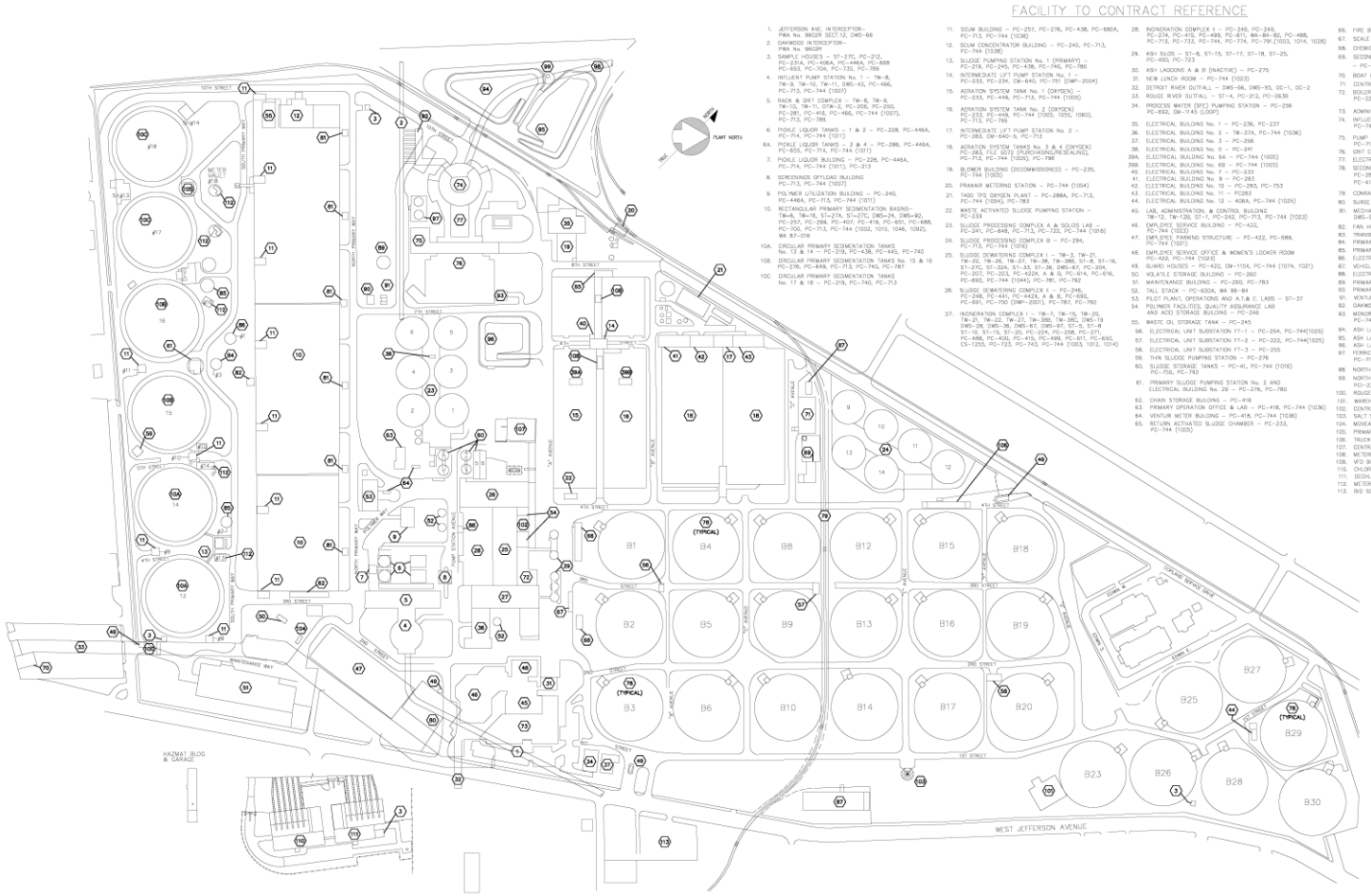


Figure VI-39. Water Resource Recovery Facility Layout

Wastewater from PS-1 and PS-2 flows by gravity to the rectangular and circular primary clarifiers. Under normal dry weather flow conditions, the rectangular clarifiers typically receive flow from PS-1, while the circular clarifiers typically receive flow from PS-2, and all the primary effluent receives secondary treatment. Under wet weather conditions, a portion of the flow from PS-1 may need to be directed to the circular clarifiers to meet the permit primary flow requirement of 1,700 MGD. The permit requires that flow up to 930 MGD be directed to secondary treatment and that flow above 930 MGD receive chlorination and be discharged through the Detroit River Outfall.

2.1.2. Secondary Treatment & Disinfection

The secondary treatment area of the WRRF consists of the following major units (continued after next page):

- ILP Station No. 1 with ILP Nos. 1 and 2
- ILP Station No. 2 with ILP Nos. 3, 4, and 7
- Four Covered Oxygen Tanks (Aeration Deck Nos. 1, 2, 3 and 4)
- One Oxygen Gas Delivery Pipeline
- One Cryogenic Oxygen Production Plant
- Twenty-five Circular Final Clarifiers
- Chlorination/Dechlorination/Outfalls
- Intermediate pumping (ILP Station Nos. 1 and 2).
- Secondary treatment using high purity oxygen activated sludge tanks and 25 secondary clarifiers.
- Disinfection of the final effluent using chlorination and dechlorination.

The Intermediate Lift Pumps (ILPs) lift primary effluent from the Primary Effluent to Activated Sludge (PEAS) Tunnel to the aeration decks. Primary effluent is mixed with return activated sludge at the head of each aeration basin. Aeration Basins Nos. 1 through 4 employ a high purity oxygen activated sludge process.

All required oxygen for the aeration system is supplied by Praxair through a dedicated pipeline. The Praxair pipeline ends at a metering station located where the old T-180 Cryogenic Plant was located (this plant was demolished as part of DWP-1013). From the metering station, an oxygen piping system ties into each aeration deck and the liquid oxygen backup system.

Four covered aeration decks use high purity oxygen for biological treatment. Aeration Deck Nos. 1 and 2 each have 10 bays, while Aeration Deck Nos. 3 and 4 have eight bays each. The volume of each aeration deck is approximately 17.8 million gallons. Oxygen is fed to the headspace at the first bay of each deck. High efficiency aerators dissolve oxygen into the wastewater and keep the mixed liquor in suspension. Primary effluent and return activated sludge (RAS) enter at the first bay of each aeration deck. All decks are equipped with mixers, a purge blower, oxygen feed and vent valves, an oxygen flow meter, and Lower Explosive Limit (LEL) and dissolved oxygen monitoring equipment.

Each aeration deck has a rated capacity of 310 MGD (+50 MGD RAS). The plant typically maintains three decks in service at all times to be able to meet the required wet weather flow of 930 MGD through secondary treatment. The fourth deck is always offline and acts as a backup. Aeration Deck No. 1 was converted to a pure oxygen system, and Aeration Deck Nos. 2, 3, and 4 were rehabilitated in 2004 through 2006 under DWP-1005 “Aeration Deck Conversion and Rehabilitation.”

The mixed liquor flows by gravity from the aeration decks and is distributed to the secondary clarifiers for solids/water separation. Variable speed vertical wet pit pumps return the activated sludge from the clarifiers to the aeration decks. Sludge is wasted on a continuous basis from the return activated sludge to Complex B gravity thickeners.

The secondary effluent is chlorinated and dechlorinated before discharge to the river through the Detroit River Outfall (DRO).

As indicated above, the secondary treatment capacity is 930 MGD during wet weather. The 930 MGD capacity is based on the following assumptions:

- 3 out of 5 ILPs each at 310 MGD
- 3 out of 4 aeration decks each at 310 MGD
- 23 of 25 clarifiers each at 40.4 MGD

The conversion of Aeration Basin No. 1 to high purity oxygen in 2004 increased its capacity from 150 MGD to a maximum of 310 MGD, providing the plant with any one basin as backup capacity. Additionally, the replacement of ILP Nos. 1 and 2 and modification to their flow metering installation under DWP-2004, increased their maximum pumping capacity from 260 MGD to 365 MGD during the year 2004. These improvements have, therefore, provided GLWA adequate redundancy to allow the maintenance staff to schedule shutdowns of aeration basins or ILPs to conduct preventive maintenance throughout the year regardless of weather conditions.

2.1.3. Residuals Management

Solids generated in primary and secondary treatment are gravity-thickened in separate facilities for primary sludge and thickened waste activated sludge for drying and disposal. A portion of the thickened sludge is pumped to the new Biosolids Drying Facility (BDF). The thickened solids are dewatered using both high solids centrifuges and belt filter presses (BFPs). Portions of the dewatered solids are incinerated. The remainder of the dewatered solids are offloaded after lime addition to trucks for either land application or landfill disposal.

2.1.4. Industrial Waste Control

The Authority's Industrial Waste Control (IWC) Division, located at 303 S. Livernois, is responsible for implementing and enforcing city and federal regulations pertaining to the pretreatment of industrial wastewater.

Industrial Waste Control charges are assessed to all commercial and industrial end users that send wastewater to the GLWA wastewater treatment plant. The IWC charges are to offset the costs incurred in administering regulatory activities under the Sewer Use Ordinance/Industrial Waste Control Ordinance as required in the National Pollutant Discharge Elimination System (NPDES) Permit Program and the Clean Water Act (CWA). There is a delegation Agreement with each community to collect the industrial waste control charges from the end-users even though most communities are contracting agency customers to the wholesale sewer contract customer.

In addition to the IWC Charges, a commercial or industrial end user may also have to pay pollutant surcharges if they discharge high-strength wastewater into the System that has compatible pollutant levels higher than is allowed for domestic sources. The IWC Group evaluates users and does testing to identify those users that have excess pollutants. The charges are used to offset the higher chemical and treatment costs for these excess pollutants in the wastewater.

2.1.5. CSO RTB & SDF

The Authority provides treatment at Combined Sewer Overflow (CSO) Retention Treatment Basins (RTB) and Screening and Disinfection Facilities (SDF) on many of its largest outfalls to provide for removal of floatable material and disinfection of wastewater prior to discharge. The CSO basins are also designed with storage capacity to contain a volume of wastewater from each storm event, including the first flush of the storm. When the storm event subsides, the captured flows are pumped back through the system for treatment at the WRRF.

GLWA operates eight of the 18 CSO control facilities tributary to GLWA's Regional Sewer System in Wayne, Oakland and Macomb Counties. GLWA operates these facilities as prescribed in a shared services agreement. The facilities are an outgrowth of the Long-Term CSO Control Plan, started in 1993 to address CSO discharges

from 78 outfalls along the Detroit and Rouge Rivers. Of the eight facilities, five are CSO RTBs and three are SDFs. The location of CSO RTBs and SDFs assets can be found on Figure VI-40.

Combined Sewer Overflow Retention Treatment Basins

CSO control is needed because the Sewer System can become overloaded during heavy rain events. In older, large metropolitan areas like Detroit, combined sewers are used to transport both wastewater and storm water in the same pipe. During rainstorms, these sewers can receive many times the volume of flow that is normally transported on a dry day. CSO control facilities capture, storage and treat these excess flows during wet weather to prevent the discharge of untreated CSO into a lake or river. Newer communities have two separate sewer systems: one to handle wastewater flow and the other for storm flow.

A CSO RTB is an underground tank that temporarily stores and treats combined sewage that previously was discharged through outfalls during storms. Flows diverted to the RTB are screened and treated with a disinfectant and discharged to the river if RTB storage capacity is exceeded. Materials removed by the screens are sent to the WRRF for disposal. The stored flows are sent to the WRRF after the storm has subsided and capacity is available in the sewer system. Many times the flows are small enough to be completely captured and stored in the RTB.

Some RTBs have a first-flush compartment used to store flow with the highest level of pollutants from the first part of the storm. These pollutants include organic material, oil, sediment, salt and lawn chemicals that are picked up by the storm water as it runs off roads and lawns. Flows from this compartment are always stored and sent to the WRRF when the RTB is emptied.

GLWA adopted a four-part strategy to address CSO:

- Source reduction – reduce the amount of storm flow that enters the wastewater system.
- In-system storage – maximize the use of existing storage space in the sewer system during storms.
- Wastewater treatment plant expansion – expand capacity of primary treatment from 1.5 to 1.7 billion gallons per day to treat more flows during storms.
- End-of-pipe treatment – construct facilities to store and treat the combined sewage, preventing it from entering area waterways unless treated and disinfected.

A summary of the overall flow and treatment capacity of the GLWA CSO RTB Facilities is shown in Table VI-5 on the following pages.

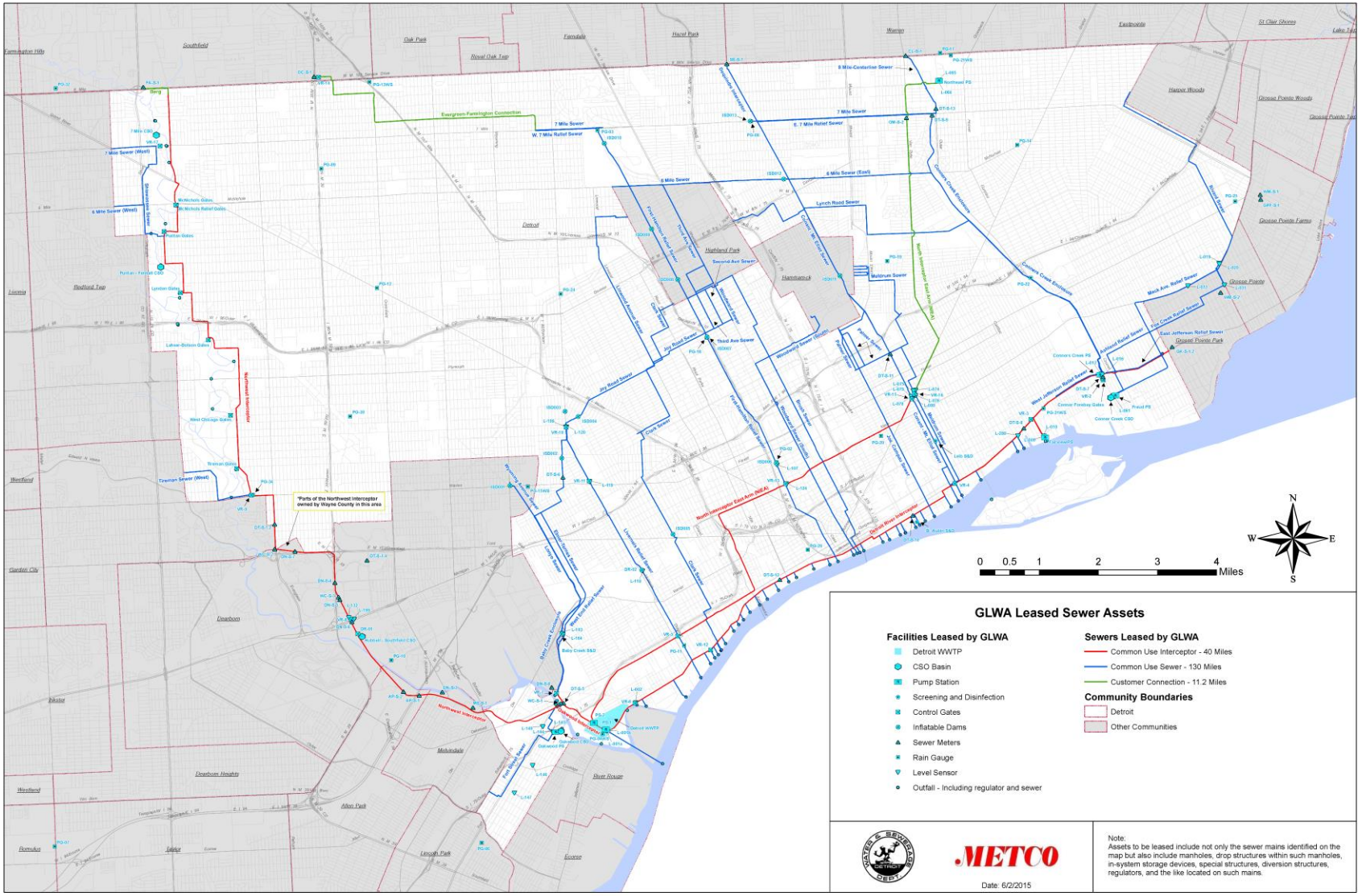


Figure VI-40. GLWA Leased Sewer Assets map

Table VI-5. Flow and Treatment Capacity of GLWA CSO RTBs[b]

	Hubbell- Southfield	Seven Mile	Puritan-Fenkell	Conner Creek	Oakwood
Year of Startup	2000	1999	1999	2005	2012
Drainage Area (Acres)[a]	14,440	463	649	83,000	1,500
Retention Volume (MG)	22	2.2	2.8	30	9.0
In-System Storage (MG)[b]	4.4	1.9	2.5	32	0
Peak Flow Rates (cfs)	3,200	656	845	13,962	1,660
Compartments	2	2	2	4	2
Sanitary Pump Station	No	No	Yes	No	Yes
Influent	Gravity	Gravity	Gravity	Gravity	Pumped
Effluent	Gravity				
Dewatering	Gravity / Pumped	Pumped	Gravity / Pumped	Pumped	Gravity / Pumped
Screening	1.5-inch Catenary- Type Bar Screens	0.5-inch Open Space Centenary-Type Bar Screens		1.5-inch Centenary Type Bar Screens	Perforated Plate Screens (6-8 mm)
Odor Control	Horizontal Wet Scrubber with Sodium Hypochlorite	Vertical Wet Scrubber with Sodium Hypochlorite		Carbon Absorption	
Flushing	Flushing Nozzles	Tipping Buckets		Flushing Gates	
Ventilation	Forced-Air				
Disinfection	Sodium Hypochlorite				

[a]Combined wet weather flow sources drained from tributary districts (acreage) is preferentially transported to the WRRF until Primary capacity is exceeded per established Operational Protocols; residual flows are transported to CSO Facilities.
[b]Tributary upstream wet weather flow volume also captured and drained to basin during events and subsequently dewatered.

CONNER CREEK CSO RTB

Figure VI-41. Conner Creek CSO RTB

Detroit's largest CSO control facility, the Conner Creek CSO RTB eliminated three outfalls and has dramatically improved water quality in Conner Creek and the Detroit River since going into operation in November 2005. This RTB provides 62 million gallons of total storage, with 30 million gallons in the retention treatment basin and 32 million gallons in upstream structures. High-speed mixers are used to rapidly disinfect flows and achieve the required fecal coliform limits. This facility was sized to provide five minutes of detention for settling and disinfection for the peak flow from the 10-year, one-hour storm.

HUBBELL-SOUTHFIELD CSO RTB

Figure VI-42. Hubbell-Southfield CSO RTB

The Hubbell-Southfield CSO RTB is one of GLWA's most active, longest operating CSO facilities and the largest on the Rouge River. Since August 1999, it has been effectively capturing and treating combined sewage through screening, settling and disinfection to meet discharge permit requirements that protect public health. Sized to fit into the available land and site constraints, the basin has a 22-million-gallon storage capacity. Located next to the Tournament Players Championship Golf Course (TPC) in Dearborn, this RTB serves as an example of how these facilities can be good neighbors and blend in with the surrounding environment. The facility features an innovative design component that enables three different operational modes within the RTB and prevents resuspension of solids during large storms with high flow rates.

OAKWOOD CSO RTB

Figure VI-43. Oakwood CSO RTB

The Oakwood CSO RTB was placed in service in 2012. Located on the lower portion of the Rouge River immediately south of I-75, the 9-million-gallon RTB is designed to provide CSO treatment through storage plus fine screening and disinfection. This facility includes a major influent pumping station with capacity to pump 1,800 cubic feet per second (cfs). This pumping station increases the level of service for the Oakwood District and helps to alleviate basement flooding in the upstream area.

PURITAN-FENKELL CSO RTB

Figure VI-44. Puritan-Fenkell CSO RTB

Located in Eliza Howell Park, the Puritan-Fenkell CSO RTB is the third Rouge River CSO RTB. This facility successfully demonstrated that a facility sized to provide 20 minutes of detention time for settling and disinfection of the one-year, one-hour storm event peak flow is sufficient to meet protection of public health standards. The 2.8-million-gallon facility became operational in August 1999, and eliminated two untreated CSO outfalls.

SEVEN MILE CSO RTB

Figure VI-45 Seven Mile CSO RTB

The Seven Mile CSO RTB was constructed at the same time as the Hubbell-Southfield and Puritan-Fenkell CSO RTBs with funding from the Rouge River National Wet Weather Demonstration Program. Located on the northeast corner of West Seven Mile Road and Shiawassee Drive, the roof of the basin also serves as the parking lot for the Greater Grace Temple. The RTB is sized to provide 30 minutes of detention time for settling and disinfection of the one-year, one-hour storm event peak flow. It has a 2.2-million-gallon storage capacity. Two untreated CSO outfalls were eliminated when it went into operation in December 1998.

Combined Sewer Overflow Screening and Disinfection Facilities

A CSO Screening and Disinfection Facility (SDF) treats combined sewage without ever storing it. Called flow-through facilities, they use fine screens to remove solids and sanitary trash from the combined sewage. Flows are injected with Sodium Hypochlorite disinfectant to kill bacteria before discharging to receiving waters (Detroit and Rouge Rivers). Materials removed by the screens are sent to the WRRF for disposal. A summary of the overall flow and treatment capacity of the GLWA CSO SDFs is shown in Table VI-6 below.

Table VI-6. Flow and Treatment Capacity CSO Screening and Disinfection Facilities

Component Criteria	Baby Creek	Leib	St. Aubin
In Service Date	2007	2002	2002
Peak Hydraulic Capacity	5,700 cfs	2,000 cfs	310 cfs
Toward Treatment Capacity	Not Applicable	150 cfs	Not Applicable
Screening Capacity	5,100 cfs	1,550 cfs	250 cfs
Disinfection Capacity (10 minute contact)	5,100 cfs	1,550 cfs	250 cfs
Dewatering Capacity		Static Volume in 24 hours	Static Volume in 24 hours
Total Disinfection Volume		225 MG	98 MG

Baby Creek Screening and Disinfection Facility

Figure VI-46. Baby Creek SDF

The Baby Creek facility is another screening and disinfection facility that uses fine screens and disinfection to treat combined sewage flows that pass through it. It is located at Miller and Industrial Drive in southwest Detroit at the city limit shared with Dearborn. The facility is rated for 5,100 cfs treatment capacity. The site area includes the Woodmere Pumping Station that services a 450-acre portion of the Baby Creek tributary area.

Leib Screening and Disinfection Facility

Figure VI-47. Leib SDF

The Leib facility was constructed to address a large outfall on the Detroit River and to demonstrate the effectiveness of fine screening (horizontal and vertical) in combination with 10 minutes of disinfection time for the design flow to meet protection of public health standards. High-energy mixers are being used to mix sodium hypochlorite to maximize bacterial kill and minimize discharge of residual chlorine to the Detroit River. The facility can treat a flow rate of up to 1,500 cfs. It began operation in 2002, and successfully achieved the required treatment levels during the demonstration period.

ST. AUBIN SCREENING AND DISINFECTION FACILITY

Figure VI-48. St. Aubin SDF

The St. Aubin facility was built at the same time as the Leib facility; it uses the same technology, but a different type of screen. While St. Aubin is much smaller, with about one fifth of the treatment capacity of Leib, it is important in addressing water quality along Chene Park (which frequently hosts concerts and other events). This facility has operated successfully since 2002.

2.1.6. General Purpose

Refer to the General Purpose description on page II-6.

2.2. Field Services

2.2.1. General Purpose

Refer to the General Purpose description on page II-6.

2.2.2. Interceptor

The Regional Wastewater Collection System (RWCS) is responsible for the conveyance of wastewater and stormwater flows to the GLWA WRRF. The collection system is the oldest part of the wastewater treatment and transportation system. Some sewers are over 130 years old and are still in service today.

The RWCS is comprised of approximately 195 miles of sewer mains. Approximately 184 miles of the mains are considered "Common Use" interceptors or trunk sewers, with the remaining 11 miles of mains being considered "Customer Connection" (i.e., a dedicated line connecting a suburban customer to the GLWA WRRF with no other customer taps to it). In addition, there are approximately 0.1 miles of force main operated and maintained by GLWA. See Figure VI-52, the map of the RWCS, and the list of all of GLWA-leased sewer main assets below. Information has been gathered in this table from best available sources, including various reference documents, as well as GIS information.

Figure VI-49, Figure VI-50, and Figure VI-51 depict the collection system inventory by material, diameter, and decade installed/age, respectively. The collection system ranges from 12 to 348 inch in diameter with an average age of 76 years.

Most of RWCS is Concrete Pipe (72%) and Brick Pipe (23%). The majority of RWCS are typically 60 inches and larger, of which 161-169 inch (12%), 120-129 (12%), and 102-108 inch (9%) are the most common conduit diameters / heights. Detroit and the region went through several growth periods of time evidenced by the greatest periods of water main installation of the 1920s (37%), 1960s (12%) and 1930s (9%).

In recent history, a condition inspection of the Detroit River Interceptor and Outfalls was performed in 2012. A prioritized condition assessment and renewal program has been underway since 2016 on the collection system gravity mains.. This effort was initiated to address the aging collection system infrastructure in a proactive and methodic fashion. As of October 2017, 119 miles of sewer has been inspected as part of this program. The plan is to have most of the Authority's gravity mains inspected by the end of 2018. Follow-up repairs and inspections are being planned and are in various stages of completion.

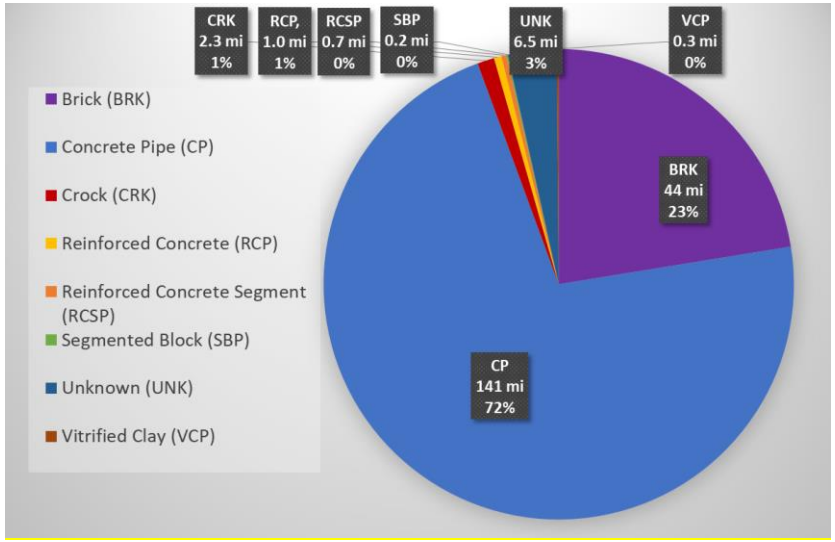


Figure VI-49. Collection system inventory by material

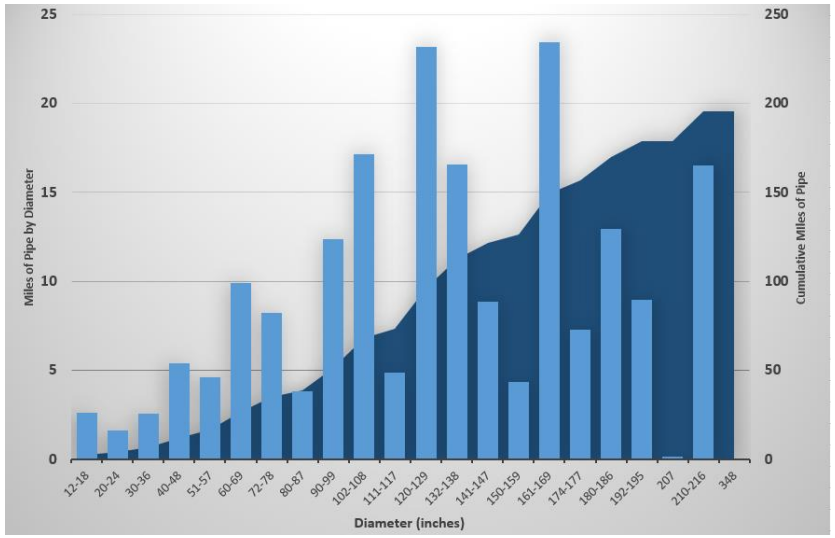


Figure VI-50. Collection system inventory by diameter / height

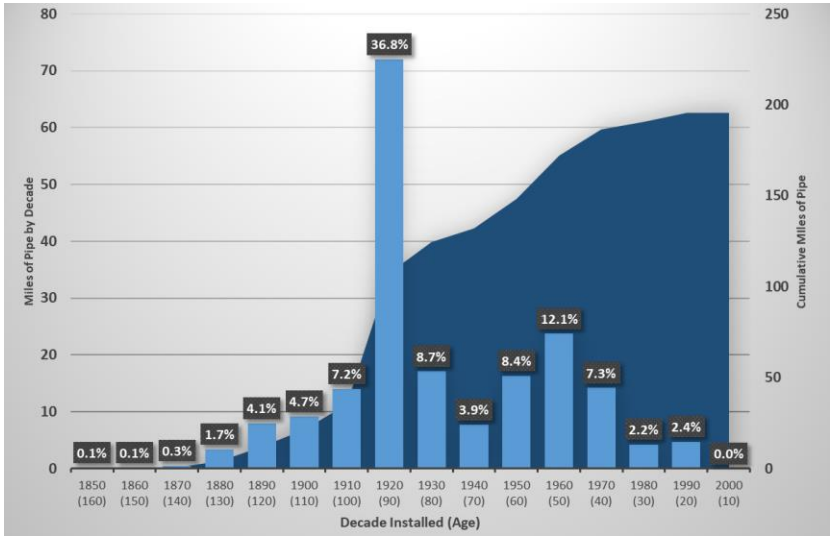


Figure VI-51. Collection system inventory by decade installed / age

Figure VI-52 depicts only those interceptors and trunk sewers operated/maintained (leased) by GLWA. The suburban communities own, operate, and maintain all of their collection system up to the points of connection to the RWCS.

There are three primary interceptors that make up the RWCS and ultimately serve all of the combined drainage districts. Those interceptors are the Detroit River Interceptor (DRI), Oakwood-Northwest Interceptor (O-NWI), and North Interceptor East Arm (NI-EA). These interceptors are shown in red/green. These primary interceptors total approximately 44 miles in length with the remaining 151 miles being trunk sewers that primarily service the City of Detroit's 9 drainage districts.

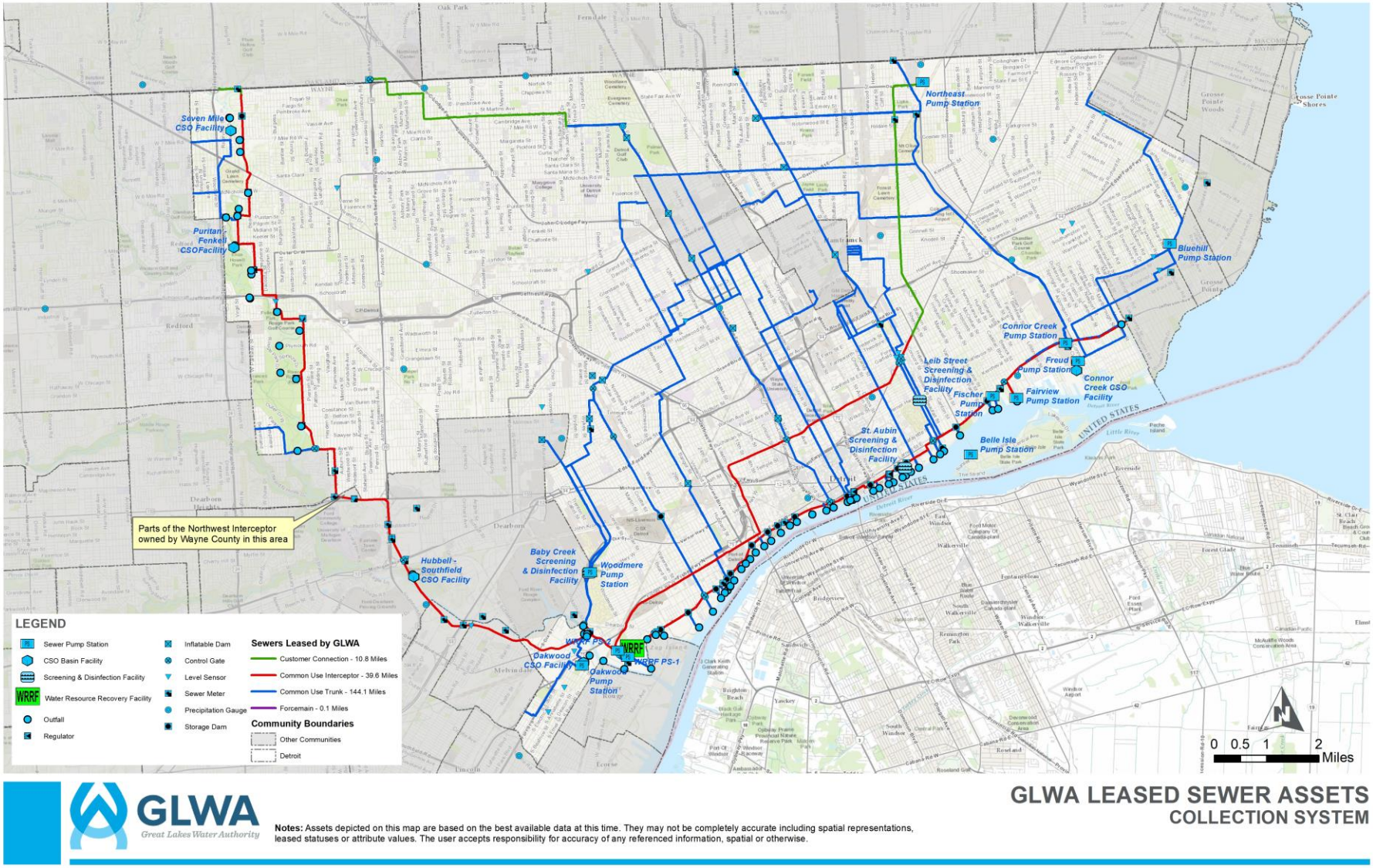


Figure VI-52. Sewer interceptors and trunk sewers operated/maintained by GLWA

Table VI-7. Sewer interceptors and trunk sewers operated/maintained by GLWA

Sewer Name	Type	Length (miles)	Size	Material	Drains to Interceptor	Years Constructed (year - year)		Age Range (years - years)		Average Age	Inspection Month / Year[1]
6 Mile Sewer	Trunk	2.9	6.25'-7.25'	Concrete / Brick	DRI	1921	1922	96	95	96	9/2017
6 Mile Sewer East	Trunk	2.6	10.5'	Concrete	DRI	1921	1927	96	90	93	9/2017
6 Mile Sewer West	Trunk	0.5	6.25'-7.25'	Concrete	O-NWI	1930	-	87	-	87	9/2017
7 Mile Sewer	Trunk	4.2	11'-6"	Concrete	DRI & NIEA	1921	1924	96	93	95	8/2017
7 Mile Sewer West	Trunk	0.7	9.25'	Brick	O-NWI	1931	-	86	-	86	10/2017
7 Mile Sewer West Relief	Trunk	1.0	6.5'-12.25'	Concrete	DRI & NIEA	1967	-	50	-	50	-
7 Mile Sewer East Relief	Trunk	3.2	5'-13'	Concrete	DRI	1962	-	55	-	55	10/2017
8 Mile-Centerline Sewer / Connors Ave. Arm	Trunk	0.7	3.5'-13.5'	Brick	DRI	1928	1930	89	87	88	-
Ashland Relief Sewer	Trunk	1.7	11.5'-16'	Concrete	DRI	1961	-	56	-	56	1/2017
Baby Creek (Dry Weather Line)	Trunk	4.6	3'	Concrete	O-NWI	1962	-	55	-	55	-
Baby Creek (Wet Weather Line)	Trunk / CSO Storage	4.6	14.5'x17.5'	Concrete	N/A - Rouge River, Miller Rd Gate Outfall	1962	-	55	-	55	-
Berg Sewer	Customer Connection	0.5	21"	CIPP	O-NWI	2015		2	2017	1010	9/2017 to 10/2017
Brush/Bates Sewer	Trunk	5.4	2.7'-13.5' 3'x4.5' (Box)	Concrete / Brick	DRI	1922		95	2017	1056	9/2017 to 10/2017
Clark Sewer, Morell, Extension of Morrell, Tuxedo	Trunk	8.0	6'-14'	Concrete / Brick	DRI	1912	1923	105	94	100	8/2017
Conant-Mt. Elliot Sewer	Trunk	7.9	11'-16.25'	Concrete	DRI & NIEA	1954	1957	63	60	62	9/2017 to 10/2017
Conner Creek Enclosure	Trunk	11.4	12'x17.5' (Box) 12.9'x17.5' (Box)	Concrete	DRI	1922	1928	95	89	92	9/2016 to 9/2017

Sewer Name	Type	Length (miles)	Size	Material	Drains to Interceptor	Years Constructed (year - year)		Age Range (years - years)		Average Age	Inspection Month / Year[1]
Dequindre Interceptor	Trunk	0.9	9'-13.75'	Concrete	DRI & NIEA	1960	1970	57	47	52	-
Detroit River Outfalls	Outfalls	10.7	1'-15.5' (Varying Shapes)	Concrete / Brick / Clay / Unknown	Detroit River	1885	1967	132	50	91	10/2016
Detroit River Interceptor (DRI)	Interceptor	12.7	8'-16'	Concrete, Brick	WRRF	1927	1936	90	81	86	07/2012 to 10/2016
East Jefferson Relief Sewer	Trunk	0.7	5'-14'	Concrete, Brick	DRI	1928	1930	89	87	88	1/2017
Elmer-Ternes Sewer (West End Relief)	Trunk	2.6	14.5' 14.5x14.5' (Box)	Concrete	O-NWI	1962	1965	55	52	54	-
Evergreen-Farmington Connection	Customer Connection	4.7	8'	Concrete	DRI & NIEA	1991	-	26	-	26	-
First-Hamilton Relief Sewer	Trunk	8.9	7'-15.5' 2.7'x4' - 10'x10.5' (Box)	Concrete	DRI & NIEA	1956	1970	61	47	54	8/2017 to 10/2017
Fort Street Sewer, Liddesdale Ave. Sewer	Trunk	2.4	2'-6'	Concrete, Crock, Brick	O-NWI	1924	1927	93	90	92	-
Fox Creek Relief Sewer, Cadieux Road Sewer	Trunk	4.0	13.5'-16'	Concrete	DRI	1948	1953	69	64	67	-
Jos. Campau Sewer	Trunk	4.5	6.75'-11.5'	Concrete / Brick	DRI	1921	1922	96	95	96	10/2017
Joy Road Sewer, Highland Park Swr - Edison Ave. Arm, Highland Park Arm	Trunk	4.1	7.75'-14'	Concrete / Brick	DRI & NIEA & O-NWI	1922	1923	95	94	95	9/2017
Linwood Ave. Sewer, Lateral Sewer - Puritan & Linwood - Puritan Ave. Arm	Trunk	3.3	1.25'-9.5' 3'x4.5' (Box) 3.3'x5' (Box)	Concrete / Brick	DRI	1919	1921	98	96	97	9/2017

Sewer Name	Type	Length (miles)	Size	Material	Drains to Interceptor	Years Constructed (year - year)		Age Range (years - years)		Average Age	Inspection Month / Year[1]
Livernois Relief Sewer	Trunk	4.9	3'-10.5' 10'x10' (Box)	Concrete	DRI & NIEA	1949	1972	68	45	57	9/2017 to 10/2017
Lonyo Sewer	Trunk	3.4	13.6' 14.5'x14' (Box)	Concrete / Brick	O-NWI	1922	-	95	-	95	9/2017
Lynch Road Sewer, Davison Ave. Sewer, Connor Creek Connection	Trunk	5.0	5.5'-11.5'	Concrete	DRI	1920	1966	97	51	74	7/2017
Mark Avenue Relief Sewer	Trunk	2.2	9.25'-14'	Concrete	DRI	1967	-	50	-	50	11/2016
Meldrum Sewer, Mt. Elliot Ave. Swr, Miller Road Swr, Carrie Ave. Relief	Trunk	6.5	1.25'-9'	Crock / Brick	DRI	1913	1930	104	87	96	10/2017
Oakland-Northwest Interceptor (O-NWI)	Interceptor	17.3	4'-13.5'	Concrete	WRRF	1928	1950	89	67	78	3/2017 to 7/2017
North Interceptor East Arm (NIEA) - Upper Portion, Northeast SPS to Gratiot	Interceptor	6.4	Varies	Concrete	WRRF & DRI	1969	1976	48	41	45	7/2015 to 8/2015
North Interceptor East Arm (NIEA) - Lower Portion, Gratiot to WRRF	Interceptor	8.7	Varies	Concrete	WRRF & DRI	1969	1976	48	41	45	-
Palmer Sewer, McDougal Blvd., Grandy Ave.	Trunk	2.0	Varies	Concrete / Brick	DRI	1885	1916	132	101	117	8/2017
Rivard Sewer	Trunk	4.0	9.25'-11.75'	Concrete	DRI	1928	1957	89	60	75	10/2016
Rouge River Outfalls	Outfalls	Varies	Varies	Concrete / Unknown	Rouge River	Varies	Varies	-	-	-	-
Shiawassee Sewer, Telegraph Swr, Puritan-Telegraph Swr	Trunk	2.0	4.25'-10.25'	Concrete	O-NWI	1930	1964	87	53	70	8/2017
Third Ave. Sewer, Second Ave. Relief, Hamilton-Woodward-Webster,	Trunk	4.5	1'-9.5' 2.5'x3.75' (Box) 3'x4.5' (Box)	Concrete / Brick	DRI & NIEA & O-NWI	1898	1931	119	86	103	8/2017 & 10/2017

Sewer Name	Type	Length (miles)	Size	Material	Drains to Interceptor	Years Constructed (year - year)		Age Range (years - years)		Average Age	Inspection Month / Year[1]
Village of Highland Park Sewer											
Tireman Sewer West	Trunk	1.6	2'-4.5'	Concrete	O-NWI	1929	1948	88	69	79	8/2017
Weatherby Ave. Sewer	Trunk	2.0	17.75'x13.4' (Box)	Concrete	DRI & NIEA & O-NWI	1921	-	96	-	96	-
West Jefferson Relief Sewer	Trunk	0.9	2'-12'	Crock, Concrete	DRI	1930	-	87	-	87	12/2016
Woodward Sewer	Trunk	0.7	5'-5.5'	Brick	DRI & NIEA & O-NWI	1892		125	2017	1071	1/2017 to 5/2017
Woodward Sewer South, Smith Ave Swr, Chrysler Exp., Fischer Freeway Swr, Civic Center Plaza, et al.	Trunk	5.4	5.25'-9' 3'x4.5 (Box)	Concrete / Brick	DRI	1890	1964	127	53	90	-
Wyoming Ave. Sewer	Trunk	0.8	11.5'	Brick	O-NWI	1923		94	2017	1056	9/2017

[1] **Sewers with inspection dates may represent partial or full inspections of the sewer lines. However, by the end of 2018, the plan is to have most of GLWA's gravity mains inspected.**

The RWCS serves 77 suburban communities that cover an area of 1,100 square miles. A large majority of the suburban communities are served by separated storm/sewer systems. The RWCS is comprised of 27 sewer districts representing drainage districts within the City of Detroit, drainage districts from adjoining counties/municipal districts, and various districts serving individual suburban communities. The sewer service areas served by the RWCS are as follows:

City of Detroit Sewer Districts

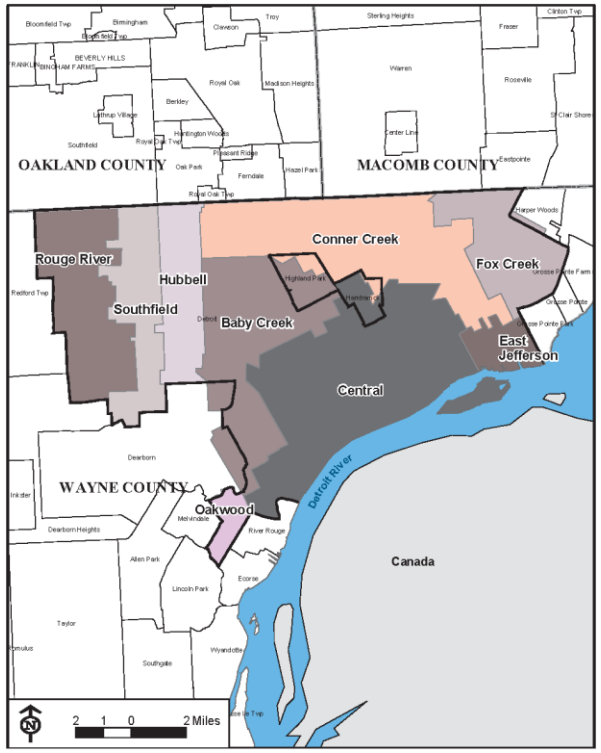


Figure VI-53. Sewer districts within Detroit

Nine sewer districts: Rouge River, Hubbell, Southfield, Baby Creek, Conner Creek, Oakwood, Central City, Fox Creek, and East Jefferson.

GLWA Regional Sewer Districts

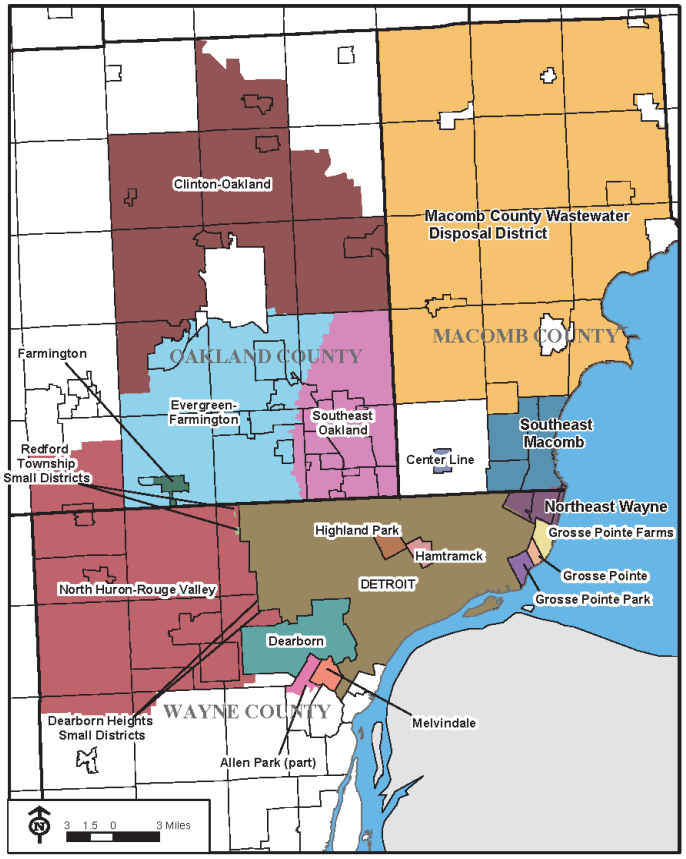


Figure VI-54. Sewer districts served by GLWA

Total GLWA Sewer Districts

Communities served by the varying sewer districts are provided below.

Table VI-8. GLWA Service Districts & Communities Served

County/ City	District	Communities
Detroit	Rouge River	City of Detroit
Detroit	Hubbell	City of Detroit
Detroit	Southfield	City of Detroit
Detroit	Baby Creek	City of Detroit, Highland Park
Detroit	Conner Creek	City of Detroit, Highland Park, Hamtramck
Detroit	Oakwood	City of Detroit
Detroit	Central City	City of Detroit
Detroit	Fox Creek	City of Detroit
Detroit	East Jefferson	City of Detroit
Macomb	Southeast Macomb Sanitary Sewer District (SEMSD)	St. Clair Shores, East Pointe, Roseville (Through NESDS)
Macomb	Macomb County Wastewater District (part of Oakland Macomb Interceptor Drainage District)	Fraser, Sterling Heights, Clinton Twp, Harrison Twp, Shelby Twp, Utica, Macomb Twp, Waldenburn, Chesterfield, New Haven, Lenox, Ray, Washington Twp
Macomb	Centerline	City of Centerline
Oakland	Evergreen-Farmington District	Farmington Hills, Orchard Lake Village, Keego Harbor, Bloomfield Hills, Bloomfield Twp, Birmingham, Franklin, Beverly Hills, Lathrup Village, Southfield, Troy
Oakland	Southeast Oakland County District (George W. Kuhn Drainage District)	Troy, Oak park, Madison Heights, Clawson, Hazel Park, Royal Oak, Pleasant Ridge, Huntington Woods, Berkley, Royal Oak Twp, Ferndale
Oakland	Clinton Oakland District (part of Oakland Macomb Interceptor Drainage District)	West Bloomfield Twp, Waterford Twp, Lake Angelis, Auburn Hills, Rochester Hills, Rochester, Oakland Twp, Orion Twp, Village of Clarkston, Independence Twp, Orion Twp, Lake Orion, Oxford Twp, City of Oxford
Oakland	City of Farmington	City of Farmington
Wayne	Rouge Valley Sewage Disposal System (RVSDS)	City of Inkster, City of Wayne, Canton Twp, Van Buren Twp, City of Westland, Garden City, Dearborn heights, Redford Twp, City of Livonia, City of Plymouth, City of Northville, City of Novi, Novi Twp, Romulus
Wayne	Northeast Sewage Disposal System (NESDS)	Harper Woods, Grosse Pointe Shores, Grosse Pointe Woods
Wayne	Grosse Pointe Farms	Grosse Pointe Farms
Wayne	Grosse pointe Park	Grosse pointe Park
Wayne	Grosse Pointe	Grosse Pointe
Wayne	City of Dearborn	City of Dearborn
Wayne	Melvindale	Melvindale
Wayne	Allen Park	Allen Park
Wayne	Redford Township	Redford Township
Wayne	Dearborn heights	Dearborn heights
Wayne	Harper Woods	Harper Woods

2.3. Systems Control Center

The Systems Control Center operates and maintains five Wastewater Pumping Stations located in the GLWA collection system that assist conveyance of wastewater and stormwater flows to the WRRF. They are Conner Sewage Pumping Station, Fairview Sewage Pumping Station, Freud Sewage Pumping Station, Northeast Sewage Pumping Station, and Oakwood Sewage Pumping Station. These facilities are described in the table below.

GLWA maintains 13 in-system storage devices throughout central Detroit and seven in-system gates throughout the west side of Detroit to maximize the storage capacity of sewers during storms. The in-system storage devices are rubber, inflatable dams located inside large trunk sewers. The in-system gates are mechanical gates located inside outfall sewers. These devices are designed to temporarily retain flows in the Sewer System during storm events up to a certain level before discharge to the river occurs. These devices operate automatically but are monitored by GLWA staff. These staff members coordinate and apply operational protocols prior to storm events to dewater the wastewater collection system and treatment facilities to maximize the available in-system storage capacity. Along with the flow control devices, the Systems Control Center team also operates and maintains many rain gauges and level sensors throughout the RWCS.

2.3.1. General Purpose

Refer to the General Purpose description on page II-6.

2.3.2. Wastewater Pumping Stations

Wastewater Pump Stations pump wastewater, and when necessary excess storm water, to the WRRF. Most of the wastewater collection system is gravity fed, but in low-lying areas, lift stations are necessary to lift wastewater to a higher elevation in order for flow by gravity to be possible. There are nine sewer lift stations in the wastewater collection system; an example is shown in Figure VI-55.

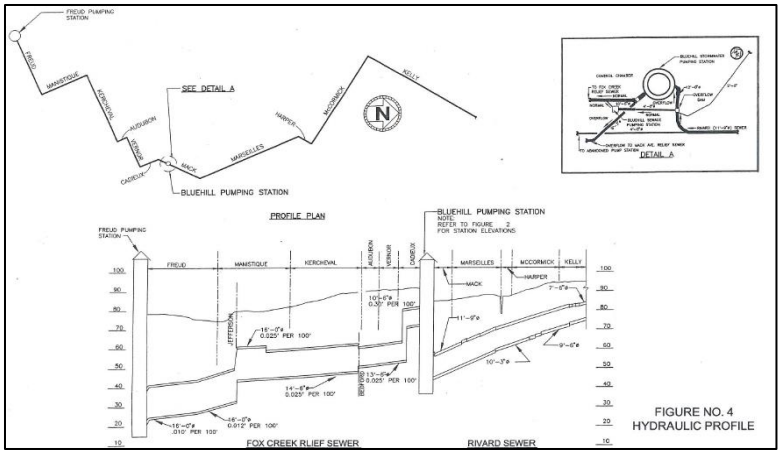


Figure VI-55. Hydraulic Profile at Bluehill Station

Conner Creek Pump Station

Figure VI-56. Conner Creek Pump Station

Max Wet Well Level	74 ft
Sanitary Pumps	SN9 - 500 Hp, 96 MGD SN10 - 350 Hp, 96 MGD SN11 - 500 Hp, 96 MGD SN12 - 200 Hp, 48 MGD
Storm Pumps	ST1- 2300 Hp, 320 MGD ST2- 2300 Hp, 320 MGD ST3- 2300 Hp, 320 MGD ST4- 2300 Hp, 320 MGD ST5- 2250 Hp, 320 MGD ST6- 2250 Hp, 320 MGD ST7- 2300 Hp, 320 MGD ST8- 2300 Hp, 320 MGD

Sewage flows by gravity to the Conner Creek Pumping Station though the western and eastern East Jefferson Avenue relief sewers. These sewers are designed to carry both sanitary sewage and storm water to the Conner Creek Pumping Station wet wells.

The Conner Creek Pumping Station is required because the elevation of the relief sewers is too low to allow the sewage to continue to flow by gravity to subsequent treatment facilities or to the Conner Creek CSO Basin. During normal dry weather flow, wastewater is discharged to the DRI. During wet weather, the wastewater is discharged to the Conner Creek CSO.

This station consists of a sanitary pump house, stormwater pump house, switch house, and backwater gates. During normal dry weather flow, wastewater is discharged by four sanitary pumps (two 71 MGD, one 48 MGD, and one 38 MGD) to the Detroit River Interceptor (DRI). During wet weather, eight stormwater pumps (318 MGD each) discharge combined wastewater to the Conner Creek CSO

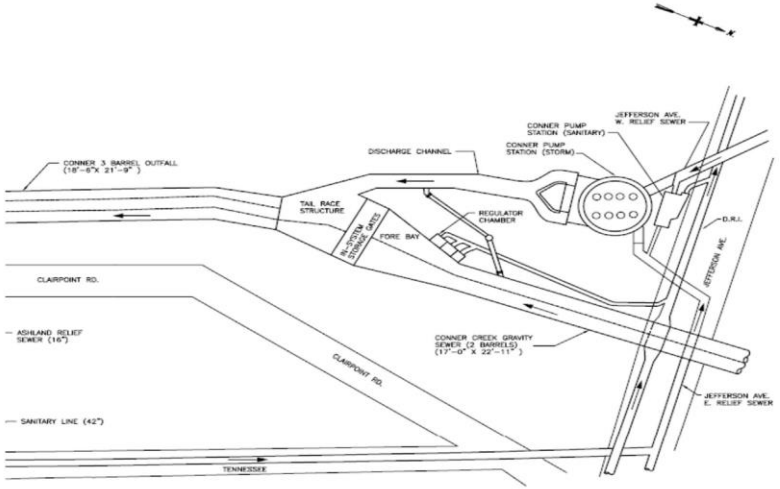


Figure VI-57. Schematic of Conner Creek Pump Station

Table VI-9. Summary of Major Rahabilitation and Improvements Projects at the Conner Pump Station

Contract No.	Contract Title	Summary of Work	Year
TW-24-A	Conner Creek	N/A.	
PC-265	Regulator Improvement-Conner Station	N/A.	
PW-212	Conner Creek Pumping Station Motor Driven Pumping Unit Nos. 5 and 6	Installation of Storm Water Pumps 5 and 6.	1947
PW-3042	Conner Creek Sanitary Pumping Station	Construction of the sanitary pump station.	1958
PC-674	Conner Station Rehabilitation	Rehabilitation of buildings at the Conner Station site and Fox Creek Backwater Gate Building. Rehabilitation of the buildings include masonry work, windows and doors, roofing and sheet metal, heating and ventilating systems, toilet facilities, lighting and electrical systems, and interior finishes. Rehabilitation of the sanitary pumps, sanitary pump motors and controls, replacement of the control switchboard for the storm water pumps, and repair the stormwater pumps. Also included are new sanitary pump isolation valves, revised suction and discharge piping, hydraulic modeling of the sanitary wet well, and replacement of stormwater sump pumps. Rehabilitation of the site shall include replacement of all roadways, curbs, sidewalks, site lighting, and demolition of the oil pump house.	May 2009
PC-713	Authority-Wide Instrumentation, Control and Computer Systems Program	Ovation System.	2007
DWS-828	Emergency Generators	Installed the four (4) Emergency Generators with power of 2MW.	December 1999
Maintenance Contract	Transformer	Replaced the powerhead on Transformer 1 and painted.	2015
PC-773	Ovation Control	Control Window upgrade from Window NT to Window 7.0.	2015
		AT&T's Wide Area Network Upgrade.	October 2016

Fairview Pump Station

Figure VI-58. Fairview Pump Station

Max Wet Well Level	20 ft
Sanitary Pumps	SN1 - 700 Hp, 96 MGD SN2 - 700 Hp, 96 MGD SN3 - 700 Hp, 96 MGD SN4 - 400 Hp, 48 MGD

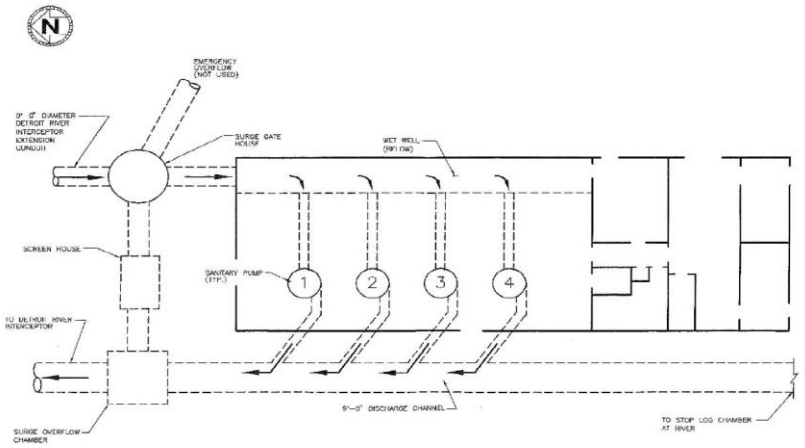


Figure VI-59. Fairview Pump Station Schematic

The Fairview Pumping Station is an interceptor pumping station on the DRI, which provides about 22 feet of lift. Wastewater flow from the DRI is lifted by pumps at the Fairview Pumping Station and discharged into the downstream DRI to continue on to the Detroit WWTP. The function of this station is to pump the wastewater received in the wet well and return it as efficiently and quickly as possible to the downstream DRI. The station facilities include the influent DRI, gatehouse, and pumping station. The pumping station consists of the pump house and wet well.

Table VI-10. Summary of Major Rehabilitation and Improvements Projects at the Fairview Pump Station

Contract No.	Contract Title	Work Summary	Year
PW	Fairview Pumping Station	Construction of Fairview Pump Station.	1913
PW-679	Fairview Additions and Alterations	Modification and upgrades at Fairview Pump Station.	1949
PC-264	Modifications to Fairview Pumping Station	Modification of riser chamber and cover, stop log chamber, and surge overflow.	Set of the drawings: April 1972
PC-606	Fairview Seawall Phase II	N/A.	
PC-684	Fairview Pumping Station Rehabilitation	Replacement of the Pump 2 and associated equipment.	1995
PC-713	Authority-Wide Instrumentation, Control and Computer Systems Program	Ovation System.	2007
PC-773	Ovation Control	Control Window upgrade from Window NT to Window 7.0.	2015
		AT&T's Wide Area Network Upgrade.	October 2016

Freud Pump Station

Figure VI-60. Freud Pump Station

Max Wet Well Level	71 ft
Sanitary Pumps	SN9 - 200 Hp, 27 MGD SN10 - 200 Hp, 13 MGD
Storm Pumps	ST1 - 3000 Hp, 290MGD ST2 - 3000 Hp, 290MGD ST3 - 3000 Hp, 290MGD ST4 - 3000 Hp, 290MGD ST5 - 3000 Hp, 290MGD ST6 - 3000 Hp, 290MGD ST7 - 3000 Hp, 290MGD ST8 - 3000 Hp, 290MGD

The Freud Pump Station consists of a pump house, wet well, and transformer enclosure area. All wastewater flow to the Freud Pumping Station is combined sanitary sewage and stormwater overflow from the East Jefferson Relief Sewer. This overflow occurs when the handling capacity of the Conner Creek Station has been exceeded. The station's primary goal is to store as much wastewater as possible until it can be pumped back to the Conner Creek Pumping Station using dewatering and sanitary pumps. From the Conner Creek Station, the wastewater is transported to Detroit WRRF. The Freud Pumping Station wet well and corresponding relief sewers provide 20 million gallons of in-line storage.

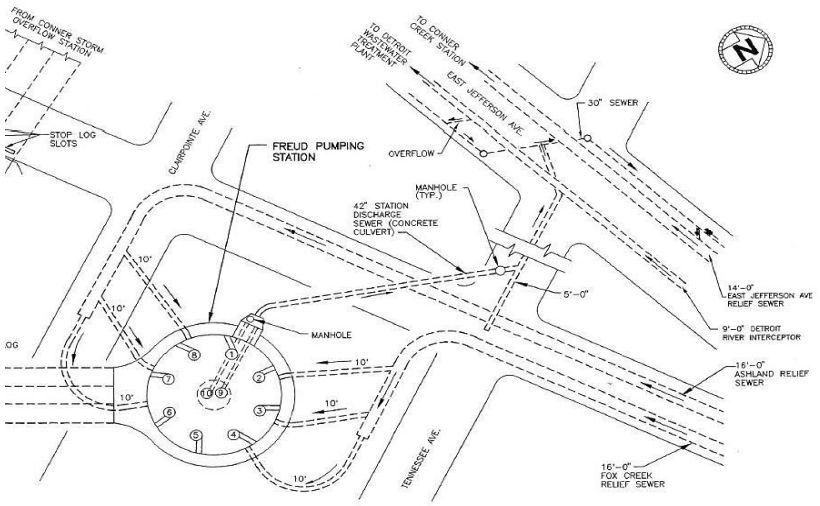


Figure VI-61. Freud Pump Station Schematic

Table VI-11 Summary of Major Rehabilitation and Improvements Projects at the Freud Pump Station

Contract	Contract Title	Work Summary	Year
PC-268	Freud Station Sewerage Discharge	N/A.	
PC-664	Freud Station Improvements Pump Replacement	Replacement of pumps.	1989
PC-685	Bluehill and Freud Sewage Pumping Station Rehabilitation	Freud Sewage Pumping Station work includes removal and replacement of switchgear and protective relaying and controls; maintaining of four bus electrical architecture; extensive rework of conduit and cables for power and control system; and other electrical work due to relocation of switchgear.	2011
PC-713	Authority-Wide Instrumentation, Control and Computer Systems Program	Ovation System.	2007
DWS-828	Emergency Generators	Installed the four (4) Emergency Generators with power of 2MW.	December 1999
PC-773	Ovation Control	Control Window upgrade from Window NT to Window 7.0.	2015
		AT&T's Wide Area Network Upgrade.	October 2016

Northeast Pump Station

Figure VI-62. Northeast Pump Station

Max Wet Well Level	26 ft
Sanitary Pumps	SN1 - 2000 Hp, 96 MGD SN2 - 2250 Hp, 96 MGD SN5 - 2000 Hp, 65 MGD SN6 - 2000 Hp, 96 MGD

The Northeast Pump Station consists of a wet well and pump house. The station receives wastewater from the 12.75-foot Corridor Interceptor. The Corridor Interceptor receives flow from the 15 Mile Interceptor, which receives flow from the Romeo Arm and Lakeshore Interceptor through the Clintondale Station. The wastewater flow to the station is nearly all sanitary sewage, with only a small portion of stormwater from suburban communities. The main goal of the pumping station is to transport wastewater to the Detroit WRRF as quickly as possible. The Northeast Pump Station is designed to pump all wastewater from the Corridor and Lakeshore connection into the 17.5-foot North Interceptor, East Arm. The wastewater flow from the North Interceptor East Arm is currently diverted to the Seven Mile Relief Sewer where it is transported by gravity through the Connant-Mt. Elliot Sewer and the DRI to the Detroit WRRF. The station receives wastewater

flow from all the communities of Macomb County (except the cities of Centerline and Warren), northeastern communities of Oakland County, and all areas served by the Lakeshore Interceptor through the Clintondale Station. The pumping station currently has six sanitary pumps with a total combined capacity of 355.4 MGD.

Table VI-12. Summary of Major Rehabilitation and Improvements Projects at the Northeast Pump Station

Contract No.	Contract Title	Work Summary	Year
PC-216	Northeast Sewage Pumping Station	The Northeast Sewage Pumping Station was built with this contract. The station consists of wet well, pump house (three sanitary pumps 1, 5, and 6), and transformer.	1969
PC-672	Northeast Sewage Station Improvements	N/A.	
PC-713	Authority-Wide Instrumentation, Control and Computer Systems Program	Ovation System.	2007
PC-736	Northeast Sewage Station-Pump No. 2 Installation	Installation of the new Pump No. 2.	May 2006 (As-built drawings)
DWS-828	Emergency Generators	Installed the tree (3) Emergency Generators with power of 2MW.	December 1999
PC-773	Ovation Control	Control Window upgrade from Window NT to Window 7.0.	2015
		AT&T's Wide Area Network Upgrade.	October 2016

Oakwood Pump Station

Figure VI-63. Oakwood Pump Station

Max Wet Well Level	79 ft	
Sanitary Pumps	SN1 - 6.4 MGD	
	SN2 - 6.4 MGD	
	SN3 - 6.4 MGD	
	SN4 - 6.4 MGD	
Storm Pumps	ST1 - 97 MGD	ST5 - 177 MGD
	ST2 - 97 MGD	ST6 - 177 MGD
	ST3 - 177 MGD	ST7 - 177 MGD
	ST4 - 177 MGD	ST8 - 177 MGD

The Oakwood Pump Station receives flow through a combined sewer collection system from Junction Chamber No. 1, which is upstream from the pumping station. Once all flows are combined at Junction Chamber No. 1, they are conveyed into the pump station through a pair of 18-foot diameter influent conduits. The combined wastewater, consisting of both sanitary and storm flows, are managed by the pump station. During normal operation, the combined wastewater is pumped by the sanitary pumps to the Detroit WRRF. When the flows into the facility exceed the capacity of these pumps during storm events, the pump station storm pumps convey any excess flow to the screenings facility and then into two 4.5 MG CSO Basins.

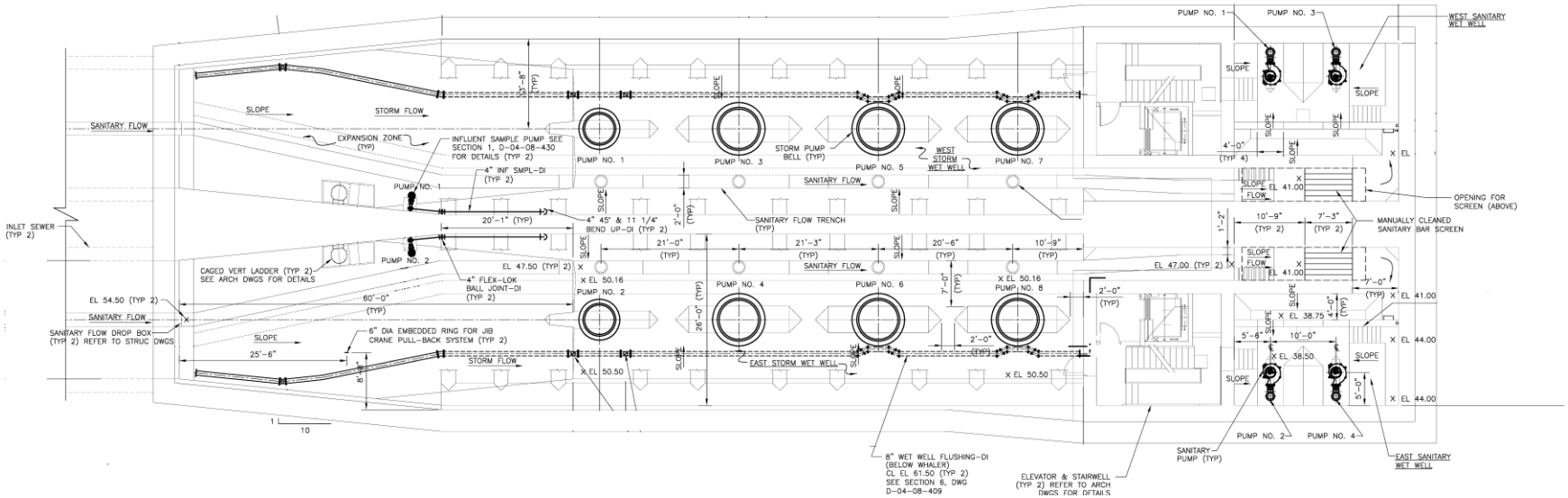


Figure VI-64. Oakwood Pump Station Schematic

Table VI-13. Wastewater Pumping Stations

Name of Pump Station	Location	Function	Sanitary Capacity				Storm Capacity				No. of Pumps	
			DESIGN		MAXIMUM		DESIGN		MAXIMUM		SANITARY	STORM
			MGD	CFS	MGD	CFS	MGD	CFS	MGD	CFS		
Conner / GLWA	12244 East Jefferson, Detroit	Sanitary / Storm	158.4	245	229.5	355	2226	3444	2544	3936	4	8
Fairview / GLWA	202 Parkview, Detroit	Sanitary	242.3	375	339.3	525	-	-	-	-	4	-
Freud / GLWA	12300 Freud, Detroit	Sanitary / Storm	12.96	20	35.64	55	2031	3143	2322	3592	2	8
Northeast / GLWA	11000 East Eight Mile, Detroit	Sanitary	162	251	258.4	400	-	-	-	-	4	-
Oakwood / GLWA	12330 Sanders, Detroit	Sanitary / Storm	13	20	26	40	246.9	382	315.4	488	4	8
Puritan-Fenkell / GLWA	Fenkell East of Telegraph, Detroit, MI 48223	Sanitary Pumps	1.4	2.2	2.8	4.4	-	-	-	-	2	-

2.3.3. In System Devices (Dams, ISD's)

Level Sensor (LS)

Level sensors detect the level of liquid in the sewers. This information is used to determine the best way to store stormwater, locate possible sewer overflows, and monitor dry weather wastewater pumping operations. There are 25 sewer level sensors located and monitored throughout the collection system. Overall, there are more than 150 level sensors in the entire System. An example is shown in Figure VI-65.

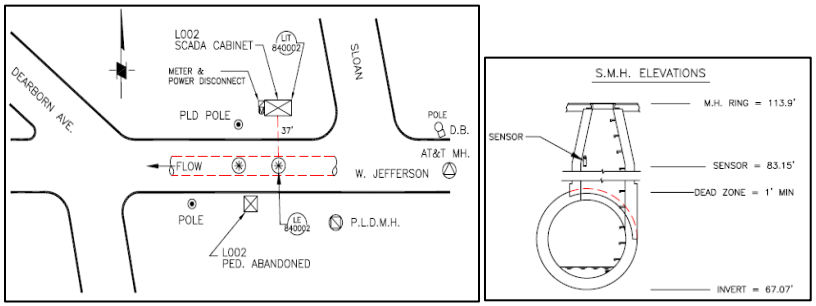


Figure VI-65. Example of a level sensor at West Jefferson and Sloan

Inflatable Storage Dam (ISD)

Inflatable Storage Dams, as illustrated in Figure VI-66, are utilized to detain upstream sewage in order to regulate flows to the WRRF. The dams can be remotely deflated and inflated as necessary.

Valve Remote (VR)

The GLWA Wastewater conveyance system has 17 Valve Remote (VR) gate locations. At these locations, one or more gates are used to selectively load the interceptors, provide in-system storage and route the flow. These gates are operated locally and remotely from the SCC during wet weather periods. During dry weather, remotely controlled gates are opened to direct flow to the interceptors, and during wet weather they are typically closed when the flow in the interceptors reach predetermined levels. Some are operated by electric operators, but the majority of them are operated by hydraulic units (SCUBA). Most of these gates were installed in the 1970s and rehabilitated in 1998 under PC-695. Average life expectancy is 20 to 35 years. An example of a valve remote location is shown in Figure VI-67.

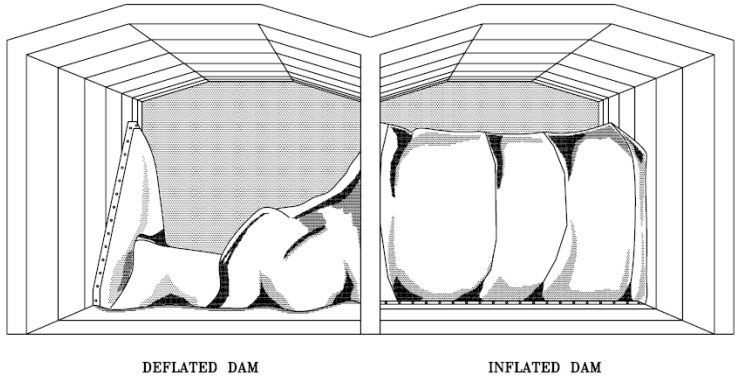


Figure VI-66. Inflatable dam illustration

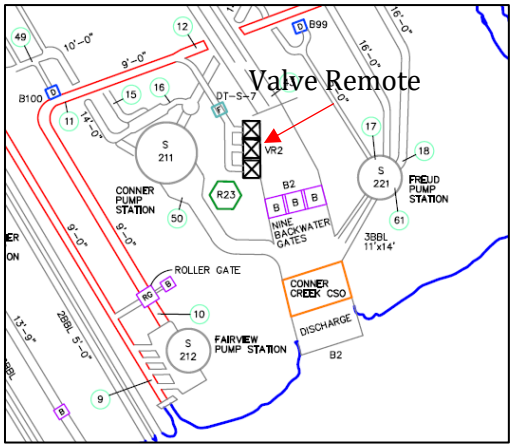


Figure VI-67. Example of VR located at Conner Pump Station

Precipitation Gage

A precipitation gauge (PG, see Figure VI-68) measures the amount of liquid precipitation over a set time period. Ovation, the Authority's Supervisory Control and Data Acquisition system, reports the precipitation data to aid the operation of the collection system and minimize combined sewer overflows during storm events. Thirty-three tipping bucket rain gages are installed throughout the service area.

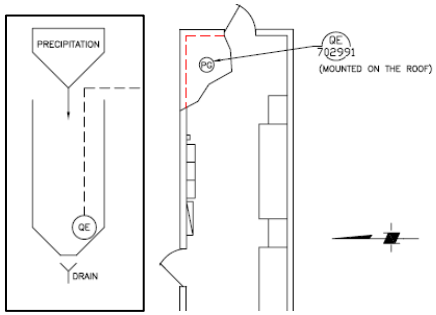


Figure VI-68. Example of Precipitation Gauge mounted on roof at Schoolcraft Pump Station

2.4. Metering

The System Analytics and Meter Operations Group is responsible for maintenance and operation of numerous remote assets used in the metering of wastewater, as well as the communication network used to transmit data from the metering locations to the head end.

The System Analytics and Meter Operations Group maintains assets at 46 sewer meter locations. Each of these locations contain equipment that is located in a control cabinet, as well as assets that are located in meter vaults. The assets that are housed in the control cabinet include Remote Terminal Units, radios, flow transmitters and level transmitters. The assets that are housed in the meter vault include flow meters and level sensors.

In addition to metering equipment, the System Analytics and Meter Operations Group maintains a 900MHz telemetry network and a Greater Detroit regional sewer system (GDRSS). The 900 MHz telemetry network is composed of 445 repeater sites. Each repeater location consists of radios and antennas. The GDRSS system collects flow and depth information from GLWA sewerage meters in five-minute increments and from rain gauges in 15-minute increments. The GDRSS portal provides a web-based interface that displays meter data (collected the day before) in both graphical and tabular formats in increments of five minute, hourly, daily, monthly, and yearly intervals. Data can be exported for off-line examination. Billing reports can be reviewed for customer analysis, as well as precipitation data.

2.4.1. General Purpose

Refer to the General Purpose description on page II-6.

2.5. General Purpose

Refer to the General Purpose description on page II-6.

2.6. Programs

Refer to the Programs description on page II-6.

SECTION 3 CENTRALIZED SERVICES

All financial figures are in thousands of dollars ($1,000's). In the Capital Expense Category (CapEx Category), projects are funded with Construction Bonds (CB) or the Improvement & Extension Fund (IE). Cost Allocation has been listed as Common to All (CTA), as explained in Chapter III.

Table VI-14. Centralized Services Projects

CIP #	Title	Budget	Year Added	CapEx Category	Cost Allocation	Lifetime Actual Thru FY 2017 (Unaudited)	Projected Expenditures							2018-2022 CIP Total	Project Total	Percent of W/S CIP
							FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond			
331001	Roofing Systems Replacement at Water Plants and Booster Pump Stations	W	2014	DE	CTA	0	3,060	2,060	2,060	0	0	0	0	4,120	7,180	0.42%
331002	Roofing Systems Replacement at GLWA WRRF, CSO Retention Treatment Basins (RTB) and Screening Disinfection Facilities (SDF)	S	2017	DE	CTA	0	0	275	505	5,375	5,110	0	0	11,265	11,265	1.44%
380400	As-needed CIP Implementation Assistance and Related Services	S	2002	IE	CTA	105	250	803	803	803	0	0	0	2,409	2,764	0.31%
380400	As-needed CIP Implementation Assistance and Related Services	W	2002	IE	CTA	105	250	803	803	803	0	0	0	2,409	2,764	0.24%
380500	Wastewater General Engineering Services on an As-needed Basis	S	2004	IE	CTA	149	110	110	88	0	0	0	0	198	457	0.03%
380600	As-Needed General Engineering Services	S	2004	IE	CTA	158	170	51	50	0	0	0	0	101	429	0.01%
380600	As-Needed General Engineering Services	W	2004	IE	CTA	158	225	265	0	0	0	0	0	265	648	0.03%
380700	As-Needed Geotechnical and Related Engineering Services	W	2006	IE	CTA	115	563	563	563	563	0	0	0	1,689	2,367	0.17%
380900	General Engineering Services	S	2007	IE	CTA	63	550	880	408	0	0	0	0	1,288	1,901	0.16%
381000	Energy Management: Electric Metering Improvement Program	S	2016	DE	CTA	0	500	500	500	500	500	500	0	2,500	3,000	0.32%
381000	Energy Management: Electric Metering Improvement Program	W	2016	DE	CTA	0	500	500	500	500	500	500	0	2,500	3,000	0.25%
351001	Water Facility Lighting Renovations	W	2017	IE	CTA	0	2774	0	0	0	0	0	0	0	2,774	0.00%
361001	Consolidated Process Control System Upgrades	S	2006	DE	CTA	174	0	0	0	0	0	0	0	0	174	0.00%
361001	Consolidated Process Control System Upgrades	W	2006	DE	CTA	147	0	0	0	0	0	0	0	0	147	0.00%
361002	Data Center Reliability/Availability Improvements	S	2009	DE	CTA	17	0	0	0	0	0	0	0	0	17	0.00%
361002	Data Center Reliability/Availability Improvements	W	2009	DE	CTA	16	0	0	0	0	0	0	0	0	16	0.00%
361003	SCADA Radio Network Upgrade	S	2009	-	CTA	852	0	0	0	0	0	0	0	0	852	0.00%
361003	SCADA Radio Network Upgrade	W	2009	-	CTA	467	0	0	0	0	0	0	0	0	467	0.00%
380500	Wastewater General Engineering Services on an As-needed Basis	W	2004	-	CTA	133	0	0	0	0	0	0	0	0	133	0.00%

CIP #	Title	Budget	Year Added	CapEx Category	Cost Allocation	Lifetime Actual Thru FY 2017 (Unaudited)	Projected Expenditures									
							FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024 & Beyond	2018-2022 CIP Total	Project Total	Percent of W/S CIP
380700	As-Needed Geotechnical and Related Engineering Services	S	2006	IE	CTA	115	0	0	0	0	0	0	0	0	115	0.00%
380800	Geotechnical and Related Services on an As-Needed Basis	S	2007	IE	CTA	82	0	0	0	0	0	0	0	0	82	0.00%
380800	Geotechnical and Related Services on an As-Needed Basis	W	2007	IE	CTA	82	0	0	0	0	0	0	0	0	82	0.00%
380900	General Engineering Services	W	2007	IE	CTA	75	0	0	0	0	0	0	0	0	75	0.00%

3.1. Information Technology

Information Technology (IT) at GLWA provides centralized technology implementation, support and services across all business functions. This includes infrastructure and cloud technologies, software and applications, desktop and computing hardware, System security, portfolio and project management services, technology forecasting and budgeting management, as well as print services and document management. The goal of the IT team is to provide reliable and forward-thinking technologies that meet the needs today, and in the future, of GLWA's various business groups, enabling them to realize their goals and make processes more effective and efficient.

3.1.1. General Purpose

Refer to the General Purpose description on page II-6.

3.1.2. Service Delivery

The Service Delivery Group provides core technology support services, including troubleshooting, desktop and laptop configuration, software installation, mobile device management, smart boards, and printers/scanners. This group also provides physical document management services, in additional to full print shop services. Projects in this area include workstation computing replacements and upgrades, software and system replacements and purchases, mobile computing technologies, printers, scanners and other all in ones devices.

3.1.3. Infrastructure

The Infrastructure Group provides administration and continuous monitoring of the GLWA business network, Internet services, data center, storage, and servers. It maintains Intermediate Distribution Facilities (IDF) and Main Distribution Facilities (MDF) across more than 40 facilities spanning the region. It also provides telephony services and all wireless internet access points. Projects that fall within this group work to improve network and telecommunications infrastructure, server hardware and systems, storage devices and related hardware, enterprise Active Directory and Office 365 infrastructure and licensing.

3.1.4. Enterprise Applications

The Enterprise Applications Group monitors and manages applications that are used by the entire organization and may be public and/or forward facing, web-based and cross-functional. These include the Geographic Information System (GIS), public website, internal (Intranet) Sharepoint site, enterprise content management systems, business intelligence, reporting analytics (KPIs), and Legistar. Projects in this group include system

replacements and/or upgrades, and new application implementations.

3.1.5. Business Applications

The Business Applications Group monitors and manages line of business applications, including database administration, for Oracle WAM (Asset Management), ServiceLink, BS&A Financials, Ceridian DayForce, LIMS/PIMS, and many other specialized software packages designed to help individual business groups improve data management and daily operations. Projects in this group include system replacements and/or upgrades, and new application implementations.

3.1.6. Security

The Enterprise Technology Security Group provides secure infrastructure support, administration, monitoring and training for network and computing security across the Authority. It participates in and supports Homeland Security initiatives and exercises, and participates in other desktop security efforts to ensure breaches are monitored, repelled and remediated on a continuous basis. Projects in this area provide additional security features, penetration testing, disaster recovery planning and implementation, and security training.

3.1.7. Project Management Office

The Program Management Office provides various administrative and strategic functions, including overall portfolio and project management, budgeting and forecasting, policy development and strategic planning, and shared services administration. Projects that fall within this group will strengthen the overall management of technology implementations at GLWA, including but not limited to project management software and systems, process and workflow development, analysis, and strategic planning.

3.2. Fleet

The Fleet Group is responsible for efficiently and effectively maintaining all GLWA Fleet and Fleet-related equipment.

The Fleet Group provides the vehicles and proper equipment for GLWA staff to accomplish their required work. The vehicles and equipment acquisition, disposal, record management, inventory and maintenance are accomplished through coordination with the DWSD Garage. All vehicles must be kept in a safe and proper manner in order to provide GLWA staff with reliable equipment to accomplish their work.

3.2.1. General Purpose

Refer to the General Purpose description on page II-6.

3.3. Facilities

The Facilities Group is responsible for efficiently and effectively maintaining all GLWA facilities and structures.

The facilities house the operations of GLWA and must remain clean, secure, environmentally safe and attractive. All systems must operate in a proper and acceptable manner in order to provide a clean and safe working environment for staff, visitors and customers. The group's objectives are accomplished by maintenance mechanics with specific skills in various trades, team leaders, administrative staff, and a manager.

3.3.1. General Purpose

Refer to the General Purpose description on page II-6.

3.4. Security

The Water and Wastewater Systems are vulnerable to a variety of security breaches and attacks. If these breaches/attacks were realized, the result could be large numbers of illnesses or casualties and/or a denial of service that would also affect public health and economic vitality. Critical services such as firefighting and healthcare (hospitals), and other dependent and interdependent sectors, would suffer negative consequences from a denial of service from the Water and Wastewater Systems. GLWA's critical security systems, both physical and electronic,

require continual upgrade and replacement to minimize the ever-present threats to GLWA staff and infrastructure.

3.4.1. General Purpose

3.5. Energy Management

The Energy Management Team has been very active in pursuing new solutions for GLWA to improve operational efficiency with new concepts and technologies to achieve sustainability. Much of the team's current work revolves around auditing existing facilities, evaluating equipment, studying various processes and developing an overall understanding of the Authority's energy consumption. Many of these initial studies, pilot projects, and evaluations will directly result in future capital investments. To ensure long-term sustainability, the Energy Management Team is in the process of developing a Strategic Energy Plan that will detail the challenges facing GLWA, establish goals and identify the methodology for measuring success.

The Energy Management Group continues to work alongside GLWA's Business Intelligence staff to collect and compile energy consumption data. The effort is evolving from the original concept of monitoring pumps' electric consumption to a broader vision of modeling the entire set of business activities that bring value to our customer communities. As this specifically relates to energy management, it is anticipated that consumption data will be compiled across multiple business areas to enable the cross-referencing between business areas by using a single data warehouse. This allows for flexibility in data mining, dashboard construction and process tracking. The results of many of these initiatives will allow the team to identify specific, prioritized areas within the Authority for future capital investment to improve efficiency.

3.5.1. General Purpose

Refer to the General Purpose description on page II-6.

3.6. Engineering

Overall engineering services required because of emergencies, immediate investigations, evaluations, and support to ensure continued operation and the highest level of service will typically be charged against projects and programs within this category. In addition, the engineering work performed will directly result in capital projects. Several categories exist that are typically needed in this manner. These categories are general engineering services, geotechnical services and CIP implementation services.

3.6.1. General Purpose

Refer to the General Purpose description on page II-6.

3.7. General Purpose

Refer to the General Purpose description on page II-6.

3.8. Programs

Refer to the Programs description on page II-6.

VII. PROJECT DESCRIPTIONS

This chapter contains a one-page description of each CIP project. These descriptions are intended to be at-a-glance information related to each project that provides a general understanding of the scope of work, project phasing and projected expenses. The full Business Case Justification documentation related to each project can be found within the Appendices.

SECTION 1 WATER

CIP Number: 111001

Old CIP No.: 1227

Project Title: LH WTP Low Lift Pumping, Filter Backwash Pumps & Flocculation Improvements

Project Status Future Planned

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Lake Huron

Review Committee Project Score: 71.6

- [x] Innovation
- [x] MP Right Sizin
- [x] System Reliability

Lake Huron WTP

Project Significance: 111003 RECLASSIFIED INTO THIS PROJECT. Improvements needed to align the existing low lift pumping rate with the Lake Huron WTP production rate per the 2015 WMPU. Currently constant speed pumping forces the WTP to operate in a batch mode. Existing electrical gear for low and high lift pumping units and filter backwash pumps are original to plant, beyond useful service life and need to be replaced to improve reliability, serviceability, maintainability, and efficiency. In addition, the existing flocculators experience high breakage rates, and by the nature of their design are difficult to access for maintenance, etc. They require replacement with a new system that is reliable and easier to maintain. Replacement of phosphoric acid chemical storage tanks and fill piping. Existing flocculator drives are horizontal type with submerged bearings that are expensive to maintain. This evaluation will focus on alternatives that may provide more efficient flocculation and are easier and less costly to maintain.

Project Engineer/Manager: Jorge Nicolas

Manager: Grant Gartrell

Scope of Work: Currently constant speed pumping forces the Lake Huron WTP to operate in a batch mode as the low lift pump capacities exceed the high lift pump capacities. Improvements needed to align the existing low lift pumping rate with the Lake Huron WTP production rate per the 2015 WMPU. Replace with new:

1. High-voltage electrical system for high lift pumps
2. Filter rate control valves and appurtenances
3. Flocculator and drives (new technology targeted)
4. Phosphoric acid storage tanks

Challenges: Coordination between existing pumping unit and motor required during design. Critical speed analysis may show pump improvements needed to operate at reduced speeds. Uncovering an innovative rehabilitation design to minimize maintenance of existing drives.

CIP Number: **111001**

Phase Expenses

PHASE **Design & Construction Assistance** | Contract No NA | Phase Status Future Planned Start

Phase Title LH WTP Low Lift Pumping Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	4,102	1,189	1,572	2,072	1,572

PHASE **Construction** | Contract No NA | Phase Status Future Planned Start

Phase Title LH WTP Low Lift Pumping Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
				8,800	18,025	18,025

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	4,102	1,189	10,372	20,097	19,597

Phase Tasks and Dates

Phase Category C

Budget Water

Phase Status Future Planned Start

Contract No NA

Cost Est Class

Construction

Task Name	Start Date	Duration	End Date
Procurement	10/27/2020	209	5/24/2021
Project Execution	5/25/2021	1091	5/20/2024
Project Closeout	5/21/2024	83	8/12/2024

Phase Category D/CA

Budget Water

Phase Status Future Planned Start

Contract No NA

Cost Est Class

Design & Construction Assistance

Task Name	Start Date	Duration	End Date
Procurement	10/27/2020	209	5/24/2021
Project Execution	5/25/2021	1091	5/20/2024
Project Closeout	5/21/2024	83	8/12/2024

CIP Number: **111001**

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		200	2,500	3,000					0	5,700
2019	0		0	0	4,102	1,189	10,372	20,097	19,597	55,357

Description of CIP Changes	rescheduled by moving back a fiscal year for the start, increased construction budget to account for inflation, changed project delivery from DBB to DB; added GLWA engineering costs. Previously presented on 10/24/17 as NEW project 111008.

CIP Number: 111002

Old CIP No.: 1280

Project Title: LH WTP Miscellaneous Mechanical Improvements

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Lake Huron

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Review Committee Project Score: 77

The photo shows the condition of the heating system hot water piping buildup which necessitates the complete replacement of the hot water radiant system in the filter building and other areas of the LH WTP.

Project Significance: Existing heating, ventilating and air-conditioning systems Lake Huron are 40 years old and are either not operable or energy-inefficient. Thus, replacement with new, energy efficient mechanical HVAC systems is needed.

Project Engineer/Manager: Todd King

Manager: Grant Gartrell

Scope of Work: The work includes replacement of the existing Natural Gas-Fired hot water boilers, back flow preventers, and dehumidification units with related accessories.

Challenges: Heating system modifications will be seasonally dependent.

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title Miscellaneous Mechanical Improvements at Lake Huron WTP

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	1,700	3,400	1,700	0	0	0	0

CIP Number: **111002**

PHASE	Study and Design and Construction Assistance	Contract No	CS-1732	Phase Status	Active
Phase Title	CS-1732, Miscellaneous Mechanical Improvements at Lake Huron WTP				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
421	222	111	0	0	0	0

PHASE	Design and Construction	Contract No		Phase Status	New
Phase Title	LH WTP Electrical & Mechanical Process Improvements				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	0	0	0		

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,121	3,622	1,811	0	0	0	0

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement	9/4/2017	151	2/2/2018
Project Execution	2/5/2018	725	1/31/2020
Project Closeout	2/3/2020	81	4/24/2020

Phase Category	D/C
Budget	Water
Phase Status	New
Contract No	
Cost Est Class	

Design and Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement	9/4/2017	151	2/2/2018
Project Execution	2/5/2018	725	1/31/2020
Project Closeout	2/3/2020	81	4/24/2020

CIP Number: **111002**

Phase Category	S/D/CA
Budget	Water
Phase Status	Active
Contract No	CS-1732
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement	9/4/2017	151	2/2/2018
Project Execution	2/5/2018	725	1/31/2020
Project Closeout	2/3/2020	81	4/24/2020

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		270	1,030	3,130	3,050	422			0	7,902
2019	18	291	2,121	3,622	1,811	0	0	0	0	7,863

Description of CIP Changes: added GLWA costs; made relatively minor increase to overall budget to account for inflation.

CIP Number: **111003**

Old CIP No.: 1289

Project Title: **LH WTP Flocculation Improvements, Alternatives**

Project Status	Reclassified	☐ Innovation
Budget:	Water	☐ MP Right Sizin
Classification Lvl 1:	Water	☐ System Reliability
Classification Lvl 2:	Treatment Plants & Facilities	
Classification Lvl 3:	Lake Huron	

Review Committee Project Score:

Project Significance: PROJECT RECLASSIFIED INTO CIP#111001: Existing flocculator drives are horizontal type with submerged bearings that are expensive to maintain. This evaluation will focus on alternatives that may provide more efficient flocculation and are easier and less costly to maintain.

Project Engineer/Manager: TBD

Manager: Grant Gartrell

Scope of Work:

Challenges: Uncovering an innovative rehabilitation design to minimize maintenance of existing drives.

CIP Number: **111003**

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			125						0	125

Description of CIP Changes

CIP Number: 111004

Old CIP No.: 1298

Project Title: LH WTP Electrical Tunnel Rehabilitation

Project Status Future Planned

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Lake Huron

Review Committee Project Score: 38.6

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Lake Huron WTP Electrical Tunnel

Project Significance: Existing electrical tunnel concrete has failed in the past and has seen emergency repairs. This project will provide permanent concrete and structural improvements to this tunnel that carries the primary electrical feed to the entire plant.

Project Engineer/Manager: Jorge Nicolas

Manager: Grant Gartrell

Scope of Work: Repairing electrical tunnel to prevent intrusion of water and further structural damage to concrete cables, duct banks and cable trays.

Challenges: None.

Phase Expenses

PHASE **Design and Build** Contract No NA Phase Status Future Planned Start

Phase Title LH WTP Electrical Tunnel Rehabilitation

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
251	3,919	1,187	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
251	3,919	1,187	0	0	0	0

CIP Number: **111004**

Phase Tasks and Dates

Phase Category	DB
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development	1/22/2018	100	5/2/2018
Procurement	7/1/2018	220	2/6/2019
Project Execution	2/6/2019	750	2/25/2021
Project Closeout	2/25/2021	90	5/26/2021

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			1,000	3,000	1,600				0	5,600
2019	0		251	3,919	1,187	0	0	0	0	5,357

Description of CIP Changes: moved construction start to FY2019, added GLWA costs, changed project delivery from DBB to DB

CIP Number: 111005

Old CIP No.: 1299

Project Title: LH WTP Concrete Crack Repair

Project Status	Closed	☐	Innovation
Budget:	Water	☐	MP Right Sizin
Classification Lvl 1:	Water	☐	System Reliability
Classification Lvl 2:	Treatment Plants & Facilities		
Classification Lvl 3:	Lake Huron		
Review Committee Project Score:			

Lake Huron WTP

Project Significance: Concrete repairs to prevent further deterioration to critical structures at Lake Huron WTP

Project Engineer/Manager: Jorge Nicolas

Manager: Grant Gartrell

Scope of Work: This project includes miscellaneous concrete and other improvements at several areas in the plant where significant damage, deterioration and water leakage exists such as basement floor slab crack, concrete spalling jointing repair, roof drainage improvement, pave service roads, walls and stairwells etc.

Challenges: N/A - Under Procurement

Phase Expenses

PHASE **Construction** Contract No LH-397 Phase Status Closed Out

Phase Title LH-397, LH WTP Concrete Crack Repair

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond

CIP Number: **111005**

Phase Tasks and Dates

Phase Category	C	**Construction**
Budget	Water	
Phase Status	Closed Out	
Contract No	LH-397	
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		600	323						0	923
2019	307	448								755

Description of CIP Changes	Project has been officially closed out. Need CIP Close-Out Summary.

CIP Number: **111006**

Old CIP No.: 1300

Project Title: **LH WTP Replacement of Filter Instrumentation and Raw Water Flow Metering Improvements**

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Lake Huron

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Review Committee Project Score: **62.2**

Raw Water Flow Meter

Project Significance: The filter instrumentation and raw water metering at the Lake Huron WTP is non-functioning and is in need of replacement. Replacement of this equipment is needed for reliable plant operations.

Project Engineer/Manager: Todd King

Manager: Grant Gartrell

Scope of Work: The filter instrumentation and raw water metering at the Lake Huron WTP is non-functioning and is in need of replacement.

Challenges: Venturi meters are non-standard dimensions and determining accuracy may be difficult.

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title LH WTP Replacement of Filter Instrumentation and Raw Water Flow Metering Improvements

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	10,250	10,250	4,500	0	0	0

CIP Number: **111006**

PHASE	Study and Design and Construction Assistance	Contract No	CS-1771	Phase Status	Active

Phase Title: CS-1771 LH WTP Replacement of Filter Instrumentation and Raw Water Flow Metering Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
567	203	186	93	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
567	10,453	10,436	4,593	0	0	0

Phase Tasks and Dates

Phase Category: C
Budget: Water
Phase Status: Future Planned Start
Contract No: NA
Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Scope Development	9/1/2017	220	4/9/2018
Procurement	4/10/2018	170	9/27/2018
Project Execution	9/28/2018	752	10/19/2020
Project Closeout	10/19/2020	91	1/18/2021

Phase Category: S/D/CA
Budget: Water
Phase Status: Active
Contract No: CS-1771
Cost Est Class:

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	9/1/2017	220	4/9/2018
Procurement	4/10/2018	170	9/27/2018
Project Execution	9/28/2018	752	10/19/2020
Project Closeout	10/19/2020	91	1/18/2021

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		100	600	12,150	11,780				0	24,630
2019	1	252	567	10,453	10,436	4,593	0	0	0	26,302

Description of CIP Changes: moved back one year for the construction start; adjusted cost up to account for revised engineering cost estimate due to 30%

CIP Number: **111006**

design completion and more scope definition since last CIP update; added GLWA costs.

CIP Number: **111007**

Old CIP No.: 1318

Project Title: **LH WTP Raw Sludge Clarifier and Raw Sludge Pumping System Improvements**

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Lake Huron

Review Committee Project Score: **53.2**

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Raw sludge clarifier at Lake Huron WTP

Project Significance: This project will provide a study and design on the structural integrity, capacity and performance requirements for pumps and piping to meet maximum design flows. The construction services will re-construct the clarifiers, piping and pumps to meet the des

Project Engineer/Manager: Todd King

Manager: Grant Gartrell

Scope of Work: The sludge clarifier is integral to the backwash water treatment system and the walls of the clarifiers are severely bowed and in the process of failing. If the clarifier and backwash tank fail, the ability to backwash the Lake Huron WTP filters will be lost and result in the loss of the Lake Huron WTP to the system until a temporary bypass can be arranged.

Challenges: Improvements will require coordination with plant operations (filter backwashing).

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title LH WTP - Raw Sludge Clarifier and Raw Sludge Pumping System Improvements

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	0	6,000	0	0	0	0

CIP Number: **111007**

PHASE	Study and Design and Construction Assistance	Contract No	CS-171	Phase Status	Under Procurement

Phase Title: CS-171, Brown & Caldwell, LH WTP-Raw Sludge Clarifier and Raw Sludge Pumping System Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
522	234	495				

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
522	234	6,495	0	0	0	0

Phase Tasks and Dates

Phase Category: C

Budget: Water

Phase Status: Future Planned Start

Contract No: NA

Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Scope Development	10/2/2017	450	12/26/2018
Procurement	12/27/2018	181	6/26/2019
Project Execution	6/27/2019	727	6/23/2021
Project Closeout	6/24/2021	83	9/15/2021

Phase Category: S/D/CA

Budget: Water

Phase Status: Under Procurement

Contract No: CS-171

Cost Est Class:

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	10/2/2017	450	12/26/2018
Procurement	12/27/2018	181	6/26/2019
Project Execution	6/27/2019	727	6/23/2021
Project Closeout	6/24/2021	83	9/15/2021

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			50	920	6,163				0	7,133
2019	0	9	522	234	6,495	0	0	0	0	7,260

Description of CIP Changes: Extended total project by one year; rounded construction to nearest million ($6-M); increased engineering costs to just over $1M;

CIP Number: **111007**

added GLWA costs.

CIP Number: 111008

Old CIP No.:

Project Title: LH WTP Architectural Programming - Laboratory and Admin Building Architectural Improvements Study

Project Status New

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Lake Huron

Review Committee Project Score: 40.6

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Lake Huron Water Treatment Plant

Project Significance: Existing laboratory and admin. Building interior is original to the plant and is in need of modernization.

Project Engineer/Manager: TBD

Manager: Grant Gartrell

Scope of Work: Modernize lab and admin building offices, common areas, conference room, lunch room, lobby, entry-way, locker rooms, showers, and bathrooms.

Challenges:

Phase Expenses

PHASE **Study** Contract No NA Phase Status New

Phase Title LH WTP Architectural Programming - Laboratory and Admin Building Architectural Improvements Study

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	300					

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	300					

CIP Number: **111008**

Phase Tasks and Dates

Phase Category	S
Budget	Water
Phase Status	New
Contract No	NA
Cost Est Class	

Study

Task Name	Start Date	Duration	End Date
Scope Development	8/1/2017	150	12/29/2017
Procurement	12/29/2017	210	7/27/2018
Project Execution	7/27/2018	365	7/27/2019
Project Closeout	7/27/2019	90	10/25/2019

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2019	0			300						300

Description of CIP Changes

CIP Number: **112001**

Old CIP No.: 1272

Project Title: **NE WTP Yard Piping Replacement (State Fair Valve Rehab)**

Project Status Future Planned ☐ Innovation

Budget: Water ☐ MP Right Sizin

Classification Lvl 1: Water ☐ System Reliability

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Northeast

Review Committee Project Score: **62.2**

Project Significance: Flow control valves are needed at the terminus of the proposed 84-inch Waterworks Park to Northeast finish water transmission system. This project is needed to control flow rates from Waterworks Park to the re-purposed Northeast system.

Project Engineer/Manager: TBD

Manager: Grant Gartrell

Scope of Work: The work includes providing and installing water main, new state fair valve and bulk heads.

Challenges: Sequencing of construction with the phase-over of Northeast WTP becoming a booster station. Connecting to existing piping and/or reservoirs will require reservoir shut and isolation, requiring close coordination with operations.

Phase Expenses

PHASE **Design and Build** Contract No Phase Status Future Planned Start

Phase Title NE WTP Yard Piping Replacement (State Fair Valve Rehab)

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
54	1,145	1,872				

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
54	1,145	1,872				

CIP Number: **112001**

Phase Tasks and Dates

Phase Category	DB
Budget	Water
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development	11/20/2017	81	2/9/2018
Procurement	2/12/2018	361	2/8/2019
Project Execution	2/11/2019	361	2/7/2020
Project Closeout	2/10/2020	81	5/1/2020

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			800						0	800
2019	0		54	1,145	1,872					3,071

Description of CIP Changes

CIP Number: 112002

Old CIP No.: 1273

Project Title: NE WTP Low Lift Pumping Plant Caisson Rehabilitation

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Northeast

Review Committee Project Score: 51.6

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Low Lift Pumping Plant at Northeast WTP

Project Significance: Preventing further degradation of steel and concrete structure of the Low Lift Pumps Caisson at the Northeast WTP

Project Engineer/Manager: Govind Patel

Manager: Grant Gartrell

Scope of Work: The work includes design and repair of concrete cracks and concrete restoration to stop leakage on the concrete covers of the encased steel beams and along the inner surfaces of the caisson wall.

Challenges: Under Procurement

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No CS-1744 Phase Status Active

Phase Title CS-1744, FKE, NE WTP Low Lift Pumping Plant Caisson Rehabilitation

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
188	86	61	0	0	0	0

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title NE WTP Low Lift Pumping Plant Caisson Rehabilitation

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
100	1,000	200	0	0	0	0

CIP Number: **112002**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
288	1,086	261	0	0	0	0

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	8/2/2016	105	11/15/2016
Procurement	11/16/2017	167	5/2/2018
Project Execution	5/3/2018	475	8/21/2019
Project Closeout	8/22/2019	83	11/13/2019

Phase Category	S/D/CA
Budget	Water
Phase Status	Active
Contract No	CS-1744
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	8/2/2016	105	11/15/2016
Procurement	11/16/2017	167	5/2/2018
Project Execution	5/3/2018	475	8/21/2019
Project Closeout	8/22/2019	83	11/13/2019

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		150	1,183						0	1,333
2019	11	152	288	1,086	261	0	0	0	0	1,798

Description of CIP Changes: Increased construction budget to $1.3M because detailed design is complete and provided a more accurate estimate of the construction; added engineering fees for CS-1744; added GLWA costs; extended project schedule to account for procurement times and construction of project based on final design documents.

CIP Number: 112003

Old CIP No.:

Project Title: NE WTP High-Lift Pumping Station Electrical Improvements

Project Status New

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Northeast

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Northeast Water Treatment Plant

Project Significance: Upgrade the existing medium voltage and low voltage electrical systems for the high-lift pumping station only.

Project Engineer/Manager: Jorge Nicolas

Manager: Grant Gartrell

Scope of Work: Electrical system improvements for high-lift pumping equipment only.

Challenges:

Phase Expenses

PHASE **Design and Build** Contract No Phase Status New

Phase Title NE WTP High-Lift Pumping Station Electrical Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
		3,527	15,772	15,772	15,772	14,572

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
		3,527	15,772	15,772	15,772	14,572

CIP Number: **112003**

Phase Tasks and Dates

Phase Category	DB
Budget	Water
Phase Status	New
Contract No	
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development	7/1/2019	123	11/1/2019
Procurement	11/4/2019	165	4/17/2020
Project Execution	4/20/2020	1453	4/12/2024
Project Closeout	4/15/2024	81	7/5/2024

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2019	0				3,527	15,772	15,772	15,772	14,572	65,415

Description of CIP Changes

CIP Number: **113001**

Old CIP No.: 262

Project Title: **SW WTP Sludge Treatment & Waste Wash Water Treatment Facilities**

Project Status Closed

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Southwest

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Aerial view of the Southwest Water Treatment Plant

Project Significance: N/A - Pending Closeout

Project Engineer/Manager: Partho Ghosh

Manager: Philip Kora

Scope of Work: N/A - Pending Closeout

Challenges: N/A - Pending Closeout

Phase Expenses

PHASE **Construction** Contract No SW-548 Phase Status Pending Close-out

Phase Title SW-548, SW WTP, Sludge Treatment & Waste Wash Water Treatment Facilities

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

CIP Number: **113001**

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	Pending Close-out
Contract No	SW-548
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	5/10/2010	1062	4/6/2013
Project Closeout	4/6/2013	1184	7/3/2016

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	47,587		1,793						0	49,380
2019	15	25	0	0	0	0	0	0	0	40

Description of CIP Changes: GLWA-Procurement has terminated the Contract with SW-548 Contractor Colasanti. Therefore no further spending is expected from this Contract. However, a final change order may need to be processed to officially close out this Contract.

CIP Number: **113002**

Old CIP No.: 1277

Project Title: **SW WTP High Lift Pump Discharge Valve Actuators Replacement**

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Southwest

Review Committee Project Score: **53.2**

- ☐ Innovation
- ☑ MP Right Sizin
- ☐ System Reliability

Oil hydraulic valve actuators leaking oil

Project Significance: Existing oil hydraulic high lift valve actuators are leaking oil and at the end of service life. The leaking actuators pose safety concerns and replacement of valve actuators is needed.

Project Engineer/Manager: Shakil Ahmed

Manager: Grant Gartrell

Scope of Work: This project involves replacement of the valve actuators at the high lift pump system as the existing oil hydraulic actuators are leaking and at the end of their service life.

Challenges: Sequencing the demolition and replacement of the existing oil hydraulic power system will require shutdown of individual high lift pumping units.

Phase Expenses

PHASE **Design & Construction Assistance** Contract No CS-034 Phase Status Active

Phase Title CS-034, Tetra Tech, High Lift Pump Discharge Valve Actuators Replacement at Southwest WTP

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	234	150	51	0	0	0	0

CIP Number: **113002**

PHASE	Construction	Contract No		Phase Status	Future Planned Start
Phase Title	Construction, SW WTP High Lift Pump Discharge Valve Actuators Replacement				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	4,000	1,000				

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
234	4,150	1,051	0	0	0	0

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	7/3/2017	240	2/28/2018
Procurement	3/1/2018	167	8/15/2018
Project Execution	8/16/2018	503	1/1/2020
Project Closeout	1/2/2020	83	3/25/2020

Phase Category	D/CA
Budget	Water
Phase Status	Active
Contract No	CS-034
Cost Est Class	

Design & Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	7/3/2017	240	2/28/2018
Procurement	3/1/2018	167	8/15/2018
Project Execution	8/16/2018	503	1/1/2020
Project Closeout	1/2/2020	83	3/25/2020

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		160	160	900	900				0	2,120
2019	3	112	234	4,150	1,051	0	0	0	0	5,550

Description of CIP Changes: Increased construction budget to reflect estimated from TetraTech 30% design; added engineering services budget; added GLWA

costs; extended schedule to account for procurement times.

CIP Number: **113003**

Old CIP No.: 1283

Project Title: **SW WTP Low and High Lift Pumping & Rapid Mix Chamber BFVs, Sluice Gates, Flocculation & Filtration System Improvements**

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Southwest

Review Committee Project Score: **67.6**

- ☐ Innovation
- ☑ MP Right Sizin
- ☐ System Reliability

Example of a butterfly valve

Project Significance: Replacing improperly functioning as well as cracked valves and gates, causing operational and maintenance concerns. Low and High Lift Pumping Improvements: Existing pumping station equipment including pumps, motors, switchgear, controls, gates, valves, etc. are all original to the plant and are over-sized for the current and projected system water demands for at least the next 20 years. The station's electrical system and controls are difficult and costly to maintain and have reduced reliability due to age and lack of available parts on the market. Large size and age of pumps and motors are inefficient. Flocculation & Filtration System Improvements: Existing filter media, auxiliary scour, backwash, and related appurtenances are all original to the plant construction (circa 1962) and need to be replaced for reliability and efficiency improvements. Flocculator equipment upgrades were identified in the 2015 WMPU project.

Project Engineer/Manager: Shakil Ahmed

Manager: Grant Gartrell

Scope of Work: The work includes study, design, and construction services for the replacement of 2 - 72" diameter butterfly valves, 4 motorized sluice gates, 7 potable sluice gates, and 1 - 36" flag valve. Replacement of high and low lift pumps, motors, motor controls, medium-voltage switchgear, and MCCs. Replace and improve filtration system equipment and components as well as flocculator equipment upgrades.

Challenges:

Phase Expenses

PHASE	Design & Construction Assistance	Contract No	NA	Phase Status	New
Phase Title	SW WTP Low and High Lift Pumping & Rapid Mix Chamber BFVs, Sluice Gates, Flocculation & Filtration System Improvements				

CIP Number: **113003**

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
		0	0	0	0	0

PHASE **Design & Construction Assistance** Contract No CS-103 Phase Status Active

Phase Title CS-103, CDM, SW WTP Replacement of Butterfly Valves and Sluice Gates for Rapid Mix Chamber

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
16	72	6,627	6,627	1,353	3,072	6,998

PHASE **Design & Construction Assistance** Contract No Phase Status New

Phase Title SW WTP Flocculation & Filtration System Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
		0				

PHASE **Construction** Contract No NA Phase Status New

Phase Title SW WTP Low and High Lift Pumping & Rapid Mix Chamber BFVs, Sluice Gates

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
				0	0	0

PHASE **Construction** Contract No Phase Status New

Phase Title SW WTP Flocculation & Filtration System Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
			0	0	0	0

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title SW WTP Low and High Lift Pumping & Rapid Mix Chamber BFVs, Sluice Gates

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
				16,355	22,140	38,495

PHASE **Construction** Contract No NA Phase Status New

Phase Title SW WTP Flocculation & Filtration System Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
						0

CIP Number: **113003**

PHASE	Construction	Contract No	NA	Phase Status	Future Planned Start
Phase Title	SW WTP Flocculation & Filtration System Improvements				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
						49,350

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
16	72	6,627	6,627	17,708	25,212	94,843

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Procurement	12/16/2024	165	5/30/2025
Project Execution	6/2/2025	1187	9/1/2028
Project Closeout	9/4/2028	81	11/24/2028

Phase Category	C
Budget	Water
Phase Status	New
Contract No	NA
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Procurement	12/16/2024	165	5/30/2025
Project Execution	6/2/2025	1187	9/1/2028
Project Closeout	9/4/2028	81	11/24/2028

CIP Number: **113003**

Phase Category	C
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Procurement	12/16/2024	165	5/30/2025
Project Execution	6/2/2025	1187	9/1/2028
Project Closeout	9/4/2028	81	11/24/2028

Phase Category	C
Budget	Water
Phase Status	New
Contract No	
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Procurement	12/16/2024	165	5/30/2025
Project Execution	6/2/2025	1187	9/1/2028
Project Closeout	9/4/2028	81	11/24/2028

Phase Category	C
Budget	Water
Phase Status	New
Contract No	NA
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Procurement	12/16/2024	165	5/30/2025
Project Execution	6/2/2025	1187	9/1/2028
Project Closeout	9/4/2028	81	11/24/2028

Phase Category	D/CA
Budget	Water
Phase Status	New
Contract No	
Cost Est Class	

Design & Construction Assistance

Task Name	Start Date	Duration	End Date
Procurement	12/16/2024	165	5/30/2025
Project Execution	6/2/2025	1187	9/1/2028
Project Closeout	9/4/2028	81	11/24/2028

CIP Number: **113003**

Phase Category	D/CA
Budget	Water
Phase Status	Active
Contract No	CS-103
Cost Est Class	

Design & Construction Assistance

Task Name	Start Date	Duration	End Date
Procurement	12/16/2024	165	5/30/2025
Project Execution	6/2/2025	1187	9/1/2028
Project Closeout	9/4/2028	81	11/24/2028

Phase Category	D/CA
Budget	Water
Phase Status	New
Contract No	NA
Cost Est Class	

Design & Construction Assistance

Task Name	Start Date	Duration	End Date
Procurement	12/16/2024	165	5/30/2025
Project Execution	6/2/2025	1187	9/1/2028
Project Closeout	9/4/2028	81	11/24/2028

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018								2,940	0	2,940
2019	0		16	72	6,627	6,627	17,708	25,212	94,843	151,105

Description of CIP Changes: Adjusted construction budget for inflation; increased overall budget due to design component; added scope related to flocculation and filtration system, added GLWA costs.

CIP Number: **113004**

Old CIP No.: 1297

Project Title: **SW WTP Raw Water Sampling Modifications**

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Southwest

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Review Committee Project Score: **44.8**

Access manhole

Project Significance: Existing raw water sampling location include recycled decant flows from residual handling facilities and do not represent a true raw water sample. A new sample pump system located upstream of the recycled decant flows is needed to obtain a true raw water

Project Engineer/Manager: Shakil Ahmed

Manager: Grant Gartrell

Scope of Work: This project will design the modifications necessary to eliminate the decant and recycle of solid handling flows from the raw water sample location serving the Southwest WTP. This project will provide for a representative raw water only sample that will improve process monitoring and associated chemical usage.

Challenges: Improvements may require another tap to the existing raw water tunnel requiring a plant shutdown (low lift pumping as a minimum). Coordination with operations required.

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title SW WTP Residual Handling Facility's Decant Flow Modifications

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	2,800	0	0	0	0	0

CIP Number: **113004**

PHASE	Study and Design and Construction Assistance	Contract No	CS-1730	Phase Status	Active

Phase Title: CS-1730, FTC&H, SW WTP Residual Handling Facility's Decant Flow Modifications

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
159	227	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
159	3,027	0	0	0	0	0

Phase Tasks and Dates

Phase Category: C
Budget: Water
Phase Status: Future Planned Start
Contract No: NA
Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Scope Development	7/27/2017	130	12/4/2017
Procurement	12/5/2017	167	5/21/2018
Project Execution	5/22/2018	363	5/20/2019
Project Closeout	5/21/2019	87	8/16/2019

Phase Category: S/D/CA
Budget: Water
Phase Status: Active
Contract No: CS-1730
Cost Est Class:

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	7/27/2017	130	12/4/2017
Procurement	12/5/2017	167	5/21/2018
Project Execution	5/22/2018	363	5/20/2019
Project Closeout	5/21/2019	87	8/16/2019

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		100	3,100	2,309					0	5,509
2019	7	135	159	3,027	0	0	0	0	0	3,328

Description of CIP Changes: Added engineering consulting budget, added GLWA costs; extended schedule to account for procurement timelines.

CIP Number: 113005

Old CIP No.:

Project Title: SW WTP Residuals Management

Project Status New

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Southwest

Review Committee Project Score: 58

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Southwest Water Treatment Plant

Project Significance: The current system is too limited with regard to the plant's ability to quickly discharge and otherwise dispose of water plant residuals from the sedimentation basins, flocculator chambers, associated channels, and the residuals handling facility raw solids storage tanks, thickeners, and associated channels to the local sewer system in instances where the plant needs to free the water treatment process from excess solids that inhibit effective water treatment.

Project Engineer/Manager: Shakil Ahmed

Manager: Grant Gartrell

Scope of Work: Study the existing design and construction of the plant facilities, determine hydraulic and treatment bottlenecks, develop alternative solutions, and identify the best alternative to quickly discharge water plant residuals from plant processes, tanks, channels, etc. to the local sewer system so that water treatment and quality problems are avoided.

Challenges:

Phase Expenses

PHASE **Study** Contract No NA Phase Status New

Phase Title SW WTP Residuals Management

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
							1,174

CIP Number: **113005**

PHASE	Design and Build	Contract No	NA	Phase Status	New
Phase Title	SW WTP Residuals Management				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
						1,174

Phase Tasks and Dates

Phase Category	DB	**Design and Build**
Budget	Water	
Phase Status	New	
Contract No	NA	
Cost Est Class	5	

Phase Category	S	**Study**
Budget	Water	
Phase Status	New	
Contract No	NA	
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2019	0								1,174	1,174

Description of CIP Changes

CIP Number: 113006

Old CIP No.:

Project Title: SW WTP Chlorine Scrubber, Raw Water Screens & Related Improvements

Project Status New

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Southwest

Review Committee Project Score: 46.6

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Southwest Water Treatment Plant

Project Significance: Existing chlorine gas scrubber needs to be replaced for reliability and safety reasons. Related improvements include ventilation, alarms, instruments, and controls. The existing raw water screens are original to the plant, do not operate and are needed to protect the low lift pumps.

Project Engineer/Manager: Shakil Ahmed

Manager: Grant Gartrell

Scope of Work: Replace the existing gas chlorine scrubber with new unit plus related ventilation, alarms, instruments, and controls; as well as replacement of the existing raw water screens.

Challenges:

Phase Expenses

PHASE **Design and Build** Contract No NA Phase Status New

Phase Title SW WTP Chlorine Scrubber, Raw Water Screens & Related Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
						7,106

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
						7,106

CIP Number: **113006**

Phase Tasks and Dates

Phase Category	DB
Budget	Water
Phase Status	New
Contract No	NA
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development	12/4/2017	39	1/12/2018
Procurement	1/15/2018	295	11/6/2018
Project Execution	11/7/2018	503	3/24/2020
Project Closeout	3/25/2020	83	6/16/2020

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2019	0								7,106	7,106

Description of CIP Changes

CIP Number: 113007

Old CIP No.:

Project Title: SW WTP Architectural and Building Mechanical Improvements

Project Status New

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Southwest

Review Committee Project Score: 36

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Southwest Water Treatment Plant

Project Significance: The existing building mechanical equipment (HVAC, dehumidification, plumbing) and architectural features (doors, windows, flooring, furnishings, etc.) throughout the facility are over 50 years old. They are beyond their useful service life and need to be replaced with more reliable, energy efficient systems. The architectural improvements will be limited to the administration and high/low lift buildings on this project. Existing filter media, auxiliary scour, backwash, and related appurtenances are all original to the plant construction (circa 1962) and need to be replaced for reliability and efficiency improvements. Flocculator equipment upgrades were identified in the 2015 WMPU project.

Project Engineer/Manager: Shakil Ahmed

Manager: Grant Gartrell

Scope of Work: Replace the dehumidification, HVAC and selected plumbing system equipment with new as well as replacing exterior and interior doors and windows with new. Renovate the existing laboratory. FROM FORMER 113008: Replace and improve filtration system equipment and components as well as flocculator equipment upgrades.

Challenges:

Phase Expenses

PHASE **Design & Construction Assistance** Contract No Phase Status New

Phase Title SW WTP Architectural and Building Mechanical Improvements

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
							6,519

CIP Number: **113007**

PHASE	Construction	Contract No		Phase Status	New
Phase Title	SW WTP Architectural and Building Mechanical Improvements				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
				0		31,000

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
				0		37,519

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	New
Contract No	
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement	8/30/2021	137	1/14/2022
Project Execution	1/17/2022	1079	12/31/2024
Project Closeout	1/1/2025	84	3/26/2025

Phase Category	D/CA
Budget	Water
Phase Status	New
Contract No	
Cost Est Class	

Design & Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement	8/30/2021	137	1/14/2022
Project Execution	1/17/2022	1079	12/31/2024
Project Closeout	1/1/2025	84	3/26/2025

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2019	0						0		37,519	37,519

Description of CIP Changes

CIP Number: **114001**

Old CIP No.: 917

Project Title: **SPW WTP 1958 Filter Rehabilitation and Auxiliary Facilities**

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Springwells

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Review Committee Project Score: **62.2**

Springwells filter building

Project Significance: Rehabilitation of Springwells WTP 1958 Filters and 1930s failed filters to provide the WTP with a renovated capacity of 295 MGD

Project Engineer/Manager: Eric Kramp

Manager: Grant Gartrell

Scope of Work: This project includes the study, design (CS-1425) and construction assistance of improvements to the Springwells WTP that includes the replacement of Phosphoric Acid Feed System, rehabilitation of the 1958 Filters, rehabilitation of failed 1930s Filters, Update of Operation and Maintenance Manuals, and addition of polymer systems and controls. Provide construction services to furnish and install new filter media, underdrains, filter valves, and rate controllers; replace the existing filter control consoles, hydraulic control valves with electric control valves, enclosures; add appurtenances to enable automatic backwashing of the filters; provide a Filter Aid Polymer System to the 1930 and 1958 filter complexes; Programmable Logic Controller-based controls for automatic control of the polymer system; install a local instrumentation and controls system.

Challenges: N/A - Active

Phase Expenses

PHASE **Construction** Contract No SP-563 Phase Status Active

Phase Title SP-563, Walsh, SPW WTP 1958 Filter Rehabilitation and Auxiliary Facilities

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	9,750	5,250	0	0	0	0	0

CIP Number: **114001**

PHASE	Study and Design and Construction Assistance	Contract No	CS-1425	Phase Status	Active

Phase Title: CS-1425, CDM, SPW WTP 1958 Filter Rehabilitation and Auxiliary Facilities

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
827	443	0	0	0	0	0

PHASE	Construction Assistance	Contract No	CS-200	Phase Status	Active

Phase Title: CS-200, CDM, SPW WTP 1958 Filter Rehabilitation and Auxiliary Facilities

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
10,577	5,693	0	0	0	0	0

Phase Tasks and Dates

Phase Category: C
Budget: Water
Phase Status: Active
Contract No: SP-563
Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Scope Development	1/1/2008	1643	7/1/2012
Procurement	7/1/2012	372	7/8/2013
Project Execution	7/8/2013	1960	11/19/2018
Project Closeout	11/20/2018	167	5/6/2019

Phase Category: CA
Budget: Water
Phase Status: Active
Contract No: CS-200
Cost Est Class:

Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	1/1/2008	1643	7/1/2012
Procurement	7/1/2012	372	7/8/2013
Project Execution	7/8/2013	1960	11/19/2018
Project Closeout	11/20/2018	167	5/6/2019

CIP Number: **114001**

Phase Category	S/D/CA
Budget	Water
Phase Status	Active
Contract No	CS-1425
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	1/1/2008	1643	7/1/2012
Procurement	7/1/2012	372	7/8/2013
Project Execution	7/8/2013	1960	11/19/2018
Project Closeout	11/20/2018	167	5/6/2019

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	56,759	20,353	310						0	77,422
2019	71,252	11,430	10,577	5,693	0	0	0	0	0	98,952

Description of CIP Changes: Updated construction based on actual invoicing to date from Walsh; extended completion due to anticipated change order for time only; added GLWA costs.

CIP Number: **114002**

Old CIP No.: 1071

Project Title: **SPW WTP Low Lift and High Lift Pump Station**

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Springwells

Review Committee Project Score: **69.2**

- ☐ Innovation
- ☑ MP Right Sizin
- ☐ System Reliability

High Lift Station viewed from Low Lift Station operating floor showing high lift pump pits and windows to be replaced.

Project Significance: Existing low & high lift pumping system electrical is original, unsafe, not reliable, and is oversized for current & projected demands. New and/or rehabilitated pumping system equipment is needed.

Project Engineer/Manager: Erich Klun

Manager: Grant Gartrell

Scope of Work: The electrical gear at the Springwells WTP high and low lift stations is old and parts are no longer available. The outdated equipment also poses safety issues. Furthermore, the pumps may be right-sized to provide more efficient pumping systems.

Challenges: Extremely complicated sequence of construction required to replace electrical gear while maintaining system demands throughout construction. During construction, new costly equipment will be operating next to existing equipment/facilities to be demolished

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title SPW WTP - Low Lift and High Lift Pump Station

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	14,000	90,000

PHASE **Study and Design and Construction Assistance** Contract No CS-103 Phase Status Under Procurement

Phase Title CS-103, SPW WTP - Low Lift and High Lift Pump Station

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	72	1,386	1,422	1,695	1,072	5,040

CIP Number: **114002**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	72	1,386	1,422	1,695	15,072	95,040

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement	1/11/2021	181	7/11/2021
Project Execution	7/12/2021	1791	6/7/2026
Project Closeout	6/8/2026	150	11/5/2026

Phase Category	S/D/CA
Budget	Water
Phase Status	Under Procurement
Contract No	CS-103
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement	1/11/2021	181	7/11/2021
Project Execution	7/12/2021	1791	6/7/2026
Project Closeout	6/8/2026	150	11/5/2026

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			1,500	2,000	12,500	22,000	21,500	26,500	0	86,000
2019	0	22	0	72	1,386	1,422	1,695	15,072	95,040	114,709

Description of CIP Changes	Refined schedule based on the pending award of the design contract as of 9/18/2017; added consultant contract costs; added GLWA costs

CIP Number: **114003**

Old CIP No.: 1264

Project Title: **WTP Water Production Flow Metering Improvements at NE, SW, and SPW WTP**

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

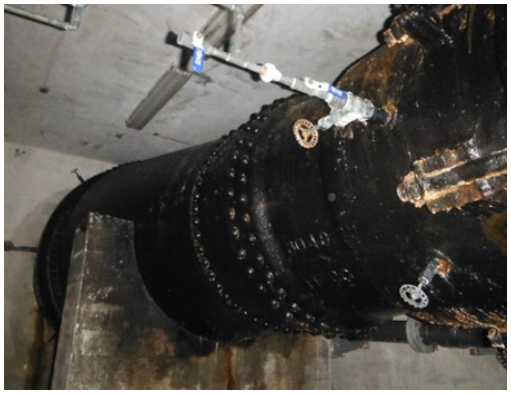
Classification Lvl 3: Springwells

Review Committee Project Score: **50.6**

☐ Innovation

☐ MP Right Sizin

☐ System Reliability



Water production flow metering device

Project Significance: Existing water production flow meters need to be rehabilitated to place back into reliable and accurate service. Once completed, accurate flow measurement from these plants will answer non-revenue water questions.

Project Engineer/Manager: Jorge Nicolas

Manager: Grant Gartrell

Scope of Work: Water production metering is needed at the Water Treatment Plants to manage non-revenue and provide estimates of usage for non-wholesale customers.

Challenges: Removing and replacing existing meters in original piping requires isolation using existing yard piping and valving. Condition of existing pipe and valves needs to be adequately addressed in the final design documents and coordinated with operations.

Phase Expenses

PHASE **Construction** Contract No CON-133 Phase Status Active

Phase Title CON-133, Water Production Flow Metering Improvements at NE, SW, and SPW WTP

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
72	222	200	2,250	3,200	2,200	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
72	222	200	2,250	3,200	2,200	0

CIP Number: **114003**

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	Active
Contract No	CON-133
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	7/31/2017	730	7/31/2019
Project Closeout	7/31/2019	90	10/29/2019

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		1,000	8,800	2,100	1,000				0	12,900
2019	171	15	72	222	200	2,250	3,200	2,200	0	8,330

Description of CIP Changes: Adjusted construction budget to reflect contract award CON-133 with the NTP issued to LCG on 7/31/2017.

CIP Number: **114004**

Old CIP No.: 1265

Project Title: **SPW WTP Concrete Crack Repairs**

Project Status Closed

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

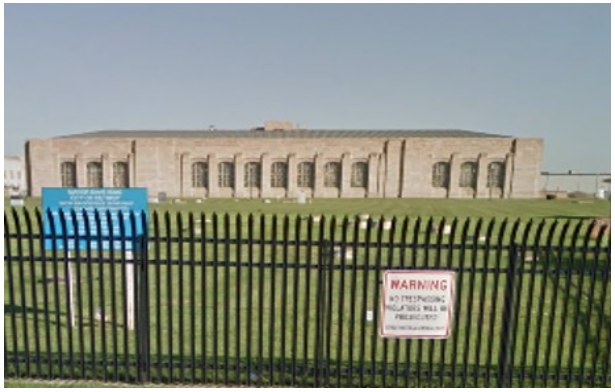
Classification Lvl 3: Springwells

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability



Springwells WTP

Project Significance: Concrete repairs to prevent further deterioration to critical structures at Springwells WTP

Project Engineer/Manager: Jorge Nicolas

Manager: Grant Gartrell

Scope of Work: This construction project involves repairing cracked and spalled concrete to stop water leaking from water-containing structures, to stop water from migrating into buildings and tunnels, and to repair deteriorated concrete where substantial delamination has occurred. The project also involves re-grading and re-constructing a plant roadway over pedestrian and utility tunnels to protect these tunnels from water infiltration and damage.

Challenges: N/A - Active

Phase Expenses

PHASE **Construction** Contract No SP-570 Phase Status Closed Out

Phase Title SP-570, SPW WTP Concrete Crack Repairs

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond

CIP Number: **114004**

Phase Tasks and Dates

Phase Category	C	**Construction**
Budget	Water	
Phase Status	Closed Out	
Contract No	SP-570	
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	398	600							0	998
2019	404	91								495

Description of CIP Changes

CIP Number: **114005**

Old CIP No.: 1266

Project Title: **SPW WTP Administration Building Improvements & Underground Fire Protection Loop**

Project Status Future Planned

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

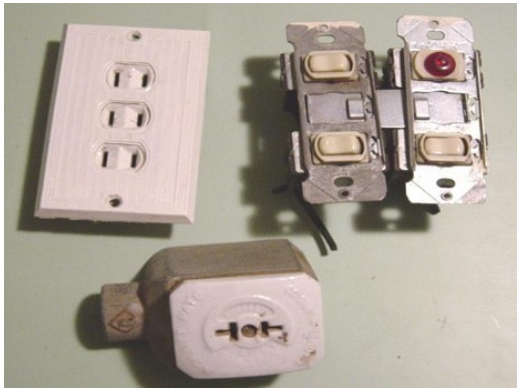
Classification Lvl 3: Springwells

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Review Committee Project Score: **67.4**



Outdated electrical outlets

Project Significance: Existing administration building is over 80 years old with many of its facilities being original. The building needs architectural, plumbing and electrical improvements. Improvements will provide reliable fire protection to all plant facilities, replace non-functioning isolation valves and hydrants, provide fire system backflow protection, and bring the fire system into conformance with the requirements of the Dearborn Fire Marshal.

Project Engineer/Manager: TBD

Manager: Grant Gartrell

Scope of Work: The work includes, but not necessarily limited to, removal and replacement of the existing plumbing piping, fittings, valves, plumbing fixtures, and any other necessary accessories. The work also includes relocating the electrical gear from basement to first floor locker room.
The existing underground fire protection line loops the Pump, Switch, Boiler and Turbine houses and is supplied water off the high lift headers in the Pump House Header Vault. The supply does not currently have backflow prevention and several branches off the loop used to feed an irrigation system serving the grassy areas covering the reservoirs, 1930 Sed. Basin and 1958 Sed. Basin. Isolation valves and fire hydrants are non-functioning and are beyond their useful life, and the old cast iron piping is susceptible to frequent breaks.

Challenges: Major component of this project includes the relocation/replacement of existing electrical gear located in the basement, and switchover to the new gear and location will need to be seamless. All plumbing needs to be replaced, the majority of which is conc The underground facilities (e.g., electrical duct banks, gas service mains, fiber optic, tunnels, conduits, major pipelines, etc.) at

Phase Expenses

PHASE	Study and Design and Construction Assistance	Contract No	NA	Phase Status	Future Planned Start
Phase Title	SPW WTP Administration Building Improvements & Underground Fire Protection Loop				

CIP Number: **114005**

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
36	186	272	333	272	236	0

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title SPW WTP Administration Building Improvements & Underground Fire Protection Loop

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
			2,000	3,000	2,000	

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
36	186	272	2,333	3,272	2,236	0

Phase Tasks and Dates

Phase Category C

Budget Water

Phase Status Future Planned Start

Contract No NA

Cost Est Class

Construction

Task Name	Start Date	Duration	End Date
Procurement	9/5/2019	181	3/4/2020
Project Execution	3/5/2020	755	3/30/2022
Project Closeout	3/31/2022	83	6/22/2022

Phase Category S/D/CA

Budget Water

Phase Status Future Planned Start

Contract No NA

Cost Est Class

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Procurement	9/5/2019	181	3/4/2020
Project Execution	3/5/2020	755	3/30/2022
Project Closeout	3/31/2022	83	6/22/2022

CIP Number: **114005**

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018				300	1,700				0	2,000
2019	0		36	186	272	2,333	3,272	2,236	0	8,335

Description of CIP Changes	Updated schedule to account for two procurements, one for A/E design and one for the construction; increased engineering services costs based on past year's experience on contracted services; increased construction cost to account for inflation; added GLWA costs. Reclassified 114014 into this project. 114004 project expenses in 2018-2022 CIP where $3,289.

CIP Number: **114006**

Old CIP No.: 1267

Project Title: **SPW WTP Replacement of Rapid Mix Units 1958 Process Train**

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

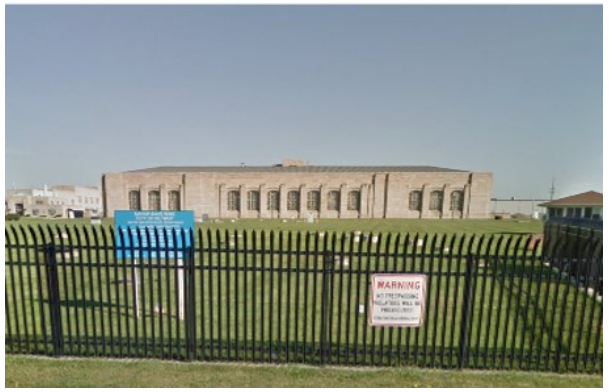
Classification Lvl 3: Springwells

Review Committee Project Score: **69.4**

☐ Innovation

☐ MP Right Sizin

☐ System Reliability



Springwells WTP

Project Significance: Existing rapid mixing units at the 1958 treatment train are not operable and are needed for effective water treatment at Springwells.

Project Engineer/Manager: Brian Dara

Manager: Grant Gartrell

Scope of Work: The work includes removal and replacement of all of the four rapid mixers including electrical, mechanical and structural components.

Challenges: Work requires treatment trains to be shut down to complete the installation/replacement, so coordination with operations and overall system demands required.

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title SPW WTP Replacement of Rapid Mix Units WTP 1958 Process Train

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	1,400	0	0	0	0	0

PHASE **Design & Construction Assistance** Contract No SCP-CS-045 Phase Status Active

Phase Title SCP-CS-045, Hazen & Sawyer, SPW WTP Replacement of Rapid Mix Units WTP 1958 Process Train

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
83	155					

CIP Number: **114006**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
83	1,555	0	0	0	0	0

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	8/3/2017	139	12/20/2017
Procurement	12/21/2017	181	6/20/2018
Project Execution	6/21/2018	363	6/19/2019
Project Closeout	6/20/2019	83	9/11/2019

Phase Category	D/CA
Budget	Water
Phase Status	Active
Contract No	SCP-CS-045
Cost Est Class	

Design & Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	8/3/2017	139	12/20/2017
Procurement	12/21/2017	181	6/20/2018
Project Execution	6/21/2018	363	6/19/2019
Project Closeout	6/20/2019	83	9/11/2019

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		100	875	275					0	1,250
2019	0	104	83	1,555	0	0	0	0	0	1,742

Description of CIP Changes: Added CS-045 engineering Hazen services budget; added GLWA costs; revised schedule to account for procurement schedule

CIP Number: **114007**

Old CIP No.: 1268

Project Title: **SPW WTP Powdered Activated Carbon System Improvements**

Project Status Future Planned

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

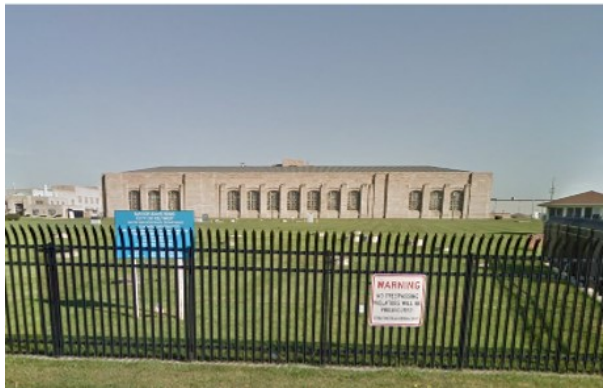
Classification Lvl 3: Springwells

Review Committee Project Score: **63.8**

☐ Innovation

☐ MP Right Sizin

☐ System Reliability



Springwells WTP

Project Significance: Existing PAC system is not operable and is needed at times to control taste and odor episodes.

Project Engineer/Manager: TBD

Manager: Grant Gartrell

Scope of Work: Existing PAC system is not operable.

Challenges: Layout of piping to correct existing problems and drainage difficult. Diffuser replacement/relocation/installation will require plant shutdowns to complete, so it will be seasonal demand dependent.

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No NA Phase Status Future Planned Start

Phase Title SPW WTP Powdered Activated Carbon System Improvements

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0		0	0	0	72	1,284

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title SPW WTP Powdered Activated Carbon System Improvements

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
							4,569

CIP Number: **114007**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0		0	0	0	72	5,853

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Procurement	8/5/2024	181	2/2/2025
Project Execution	2/3/2025	363	2/1/2026
Project Closeout	2/2/2026	81	4/24/2026

Phase Category	S/D/CA
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Procurement	8/5/2024	181	2/2/2025
Project Execution	2/3/2025	363	2/1/2026
Project Closeout	2/2/2026	81	4/24/2026

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018					900	2,000			0	2,900
2019	0		0		0	0	0	72	5,853	5,925

Description of CIP Changes	Revised schedule to account for DBB multi procurements; added engineering services costs; added GLWA costs; adjusted construction estimate for inflation.

CIP Number: **114008**

Old CIP No.: 1269

Project Title: **SPW WTP 1930 Sedimentation Basin Sluice Gates, Guides & Hoists Improvements**

Project Status Future Planned

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Springwells

Review Committee Project Score: **52.8**

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

NONE

Project Significance: Existing sedimentation basin gates, guides and hoists are early 1930s and are in need of upgrade. Further, upgrades must result in a safer mode of gate operation.

Project Engineer/Manager: TBD

Manager: Grant Gartrell

Scope of Work: This project will evaluate and rehabilitate or replace the sluice gates, guides and hoists at the 1930s Filter Building at the Springwells Water Treatment Plant. These gates and appurtenances have surpassed their expected service life and require rehabilitation and/or replacement for the isolation and operation of the 1930s filters and overall maintenance of various systems at the Springwells WTP. Options for maintenance of flows are limited with current condition of these gates.

Challenges: Work will either require sedimentation basins to be shut down and dewatered or the work performed by divers. In either case, portions of the 1930 plant will need to be shut down to complete the work.

Phase Expenses

PHASE **Design and Build** Contract No NA Phase Status Future Planned Start

Phase Title 1930 Sedimentation Basin Sluice Gates, Guides & Hoists Improvements at Springwells WTP

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	54	2,054	7,072	7,072	1,036	0	0

CIP Number: **114008**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
54	2,054	7,072	7,072	1,036	0	0

Phase Tasks and Dates

Phase Category	DB
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development	11/10/2017	167	4/26/2018
Procurement	4/27/2018	181	10/25/2018
Project Execution	10/26/2018	1091	10/21/2021
Project Closeout	10/22/2021	90	1/20/2022

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			1,200	2,000	4,000	300			0	7,500
2019	0		54	2,054	7,072	7,072	1,036	0	0	17,288

Description of CIP Changes: Changed to design-build project delivery; pushed back schedule by a year; increased overall delivery schedule to account for procurement of DB contractor, increased budget for inflation; added GLWA costs.

CIP Number: 114009

Old CIP No.: 1295

Project Title: SPW WTP Service Area Redundancy Study

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Springwells

Review Committee Project Score: 78

- ☐ Innovation
- ☑ MP Right Sizin
- ☑ System Reliability

NONE

Project Significance: Hydraulic analysis and Evaluation of options to maintain adequate pressure at Springwell's high pressure district. FROM 132010: Construction of West Service Center Division Valves is needed to convey Lake Huron flows through the West Service Center to the Springwells high service area while the Springwells raw water tunnel is out of service for repairs. Construction of active bypass around the Newburgh Pump Station.

Project Engineer/Manager: Timothy Kuhns

Manager: Grant Gartrell

Scope of Work: This study involves hydraulic analyses and evaluation of options to transmit finished water from the Lake Huron Water Treatment Plant through the West Service Center in order to provide finished water to the Springwells Water Treatment Plant's high-pressure district. FROM 132010: Lake Huron WTP needs to provide flows to the Springwells high service area while the Springwells raw water tunnel is out of service for repair.

Challenges: N/A - Under Procurement. FROM 132010: Coordination with operations critical meet testing of existing valves. Isolation, shutdown and operation of Lake Huron and Springwells WTPs, North Service Center, and other facilities.

Phase Expenses

PHASE **Study** Contract No CS-1772 Phase Status Active

Phase Title Springwells Water Treatment Plant Service Area Redundancy Study

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	191	105	0	0	0	0	0

CIP Number: **114009**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
191	105	0	0	0	0	0

Phase Tasks and Dates

Phase Category	S
Budget	Water
Phase Status	Active
Contract No	CS-1772
Cost Est Class	

Study

Task Name	Start Date	Duration	End Date
Scope Development	10/24/2017	125	2/26/2018
Procurement	2/27/2018	295	12/19/2018
Project Execution	12/20/2018	363	12/18/2019
Project Closeout	7/1/2019	87	9/26/2019

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		450							0	450
2019	0	193	191	105	0	0	0	0	0	489

Description of CIP Changes: Changed allocation of expenses. Updated Project Prioritization.

CIP Number: **114010**

Old CIP No.: 1306

Project Title: **SPW WTP Yard Piping and High Lift Header Improvements**

Project Status Future Planned

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Springwells

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Review Committee Project Score: **62.2**

Springwells WTP

Project Significance: Six (6) of the seven (7) 72-inch mains leaving the site are original to the 1930 plant construction and consist of riveted steel pipe material. Main No. 7 is a prestressed concrete cylinder pipe material installed in 1958. The steel mains are known to be leaking and are in need of replacement to maintain system reliability. Additionally, isolation valves associated with the 72-inch mains need to be replaced. Other yard piping, including gravity sewers and process piping, need to be assessed and replaced and or rehabilitated.

Project Engineer/Manager: Erich Klun

Manager: Grant Gartrell

Scope of Work: Existing yard piping is original riveted steel from the early 1930s and has experienced leaks. These leaks have potential to disrupt service to Springwells Service area customers. Scope will also include performing a condition assessment, cleaning and replacement/rehabilitation of all gravity sewers (including manholes) and other pressure pipe. Other site improvements will include replacement of access drives, new guard shack, construction trailer utility hook-up station, and other site miscellaneous site improvements. Formerly CIP 1248.

Challenges: Complex construction sequencing, and reliability of existing gate valves for isolation will be critical. Design will need to address the isolation valve issue, as well as the condition of the existing yard piping being connected to.

Phase Expenses

PHASE **Design and Build** Contract No NA Phase Status Future Planned Start

Phase Title SPW WTP Yard Piping Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	139,652

CIP Number: **114010**

PHASE	**Design**	Contract No	NA	Phase Status	Future Planned Start
Phase Title	SPW WTP Yard Piping Improvements				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	139,652

Phase Tasks and Dates

Phase Category	D	**Design**
Budget	Water	
Phase Status	Future Planned Start	
Contract No	NA	
Cost Est Class		

Phase Category	DB	**Design and Build**
Budget	Water	
Phase Status	Future Planned Start	
Contract No	NA	
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018				2,000	7,000	8,000	8,000		0	25,000
2019	0		0	0	0	0	0	0	139,652	139,652

Description of CIP Changes: Further defined scope to include all site improvements since the site will be dug up to replace the major yard piping, including

CIP Number: **114010**

gravity sewers and drains, pressure piping, etc. Combined the header vault and yard piping design and construction.

CIP Number: **114011**

Old CIP No.: 1307

Project Title: **SPW WTP Steam, Condensate Return, and Compressed Air Piping Improvements**

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Springwells

Review Committee Project Score: **62.4**

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

SP-563 – Rehabilitated 1958 Pipe Gallery (in progress)

Project Significance: These existing mechanical systems are largely broken and leaking creating an inefficient use of energy.

Project Engineer/Manager: Eric Kramp

Manager: Grant Gartrell

Scope of Work: This engineering services contract involves designing a new, more energy-efficient steam heating system for the entire Springwells Water Treatment Plant, including all steam unit heaters, steam piping, condensate return piping, condensate return pumping stations, steam pressure reducing valves, and appurtenances. This project also involves replacing the compressed air piping in the plant used for service air. Once completed, the project will provide energy savings by eliminating extensive steam and condensate leaking currently inherent in the antiquated system. This project includes design and construction administration (CS-1671) and construction (SP-TBD) to replace the leaking steam piping, condensate return piping and compressed air piping throughout the Springwells WTP. The scope of work includes replacing inefficient unit heaters, radiators, condensate return pump stations, pressure reducing valves, regulators, and heating system appurtenances throughout the plant. Once completed, the project will provide energy savings by eliminating extensive steam and condensate leaking currently inherent in the antiquated system.

Challenges: Many components of the existing system are original to the existing heating system, are not functioning and need to be demolished/removed. Seasonal work and sequencing with the heating season is required.

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title Steam, Condensate Return, and Compressed Air Piping Improvements at Springwells WTP

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	2,000	5,000	1,200	0	0	0

CIP Number: **114011**

PHASE	Study and Design and Construction Assistance	Contract No	CS-1671	Phase Status	Active
Phase Title	Steam, Condensate Return, and Compressed Air Piping Improvements at Springwells WTP				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
51	185	272	136	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
51	2,185	5,272	1,336	0	0	0

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	1/15/2018	0	1/15/2018
Procurement	1/15/2018	209	8/12/2018
Project Execution	8/13/2018	837	11/27/2020
Project Closeout	11/30/2020	81	2/19/2021

Phase Category	S/D/CA
Budget	Water
Phase Status	Active
Contract No	CS-1671
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	1/15/2018	0	1/15/2018
Procurement	1/15/2018	209	8/12/2018
Project Execution	8/13/2018	837	11/27/2020
Project Closeout	11/30/2020	81	2/19/2021

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		300	3,450	2,500					0	6,250
2019	19	261	51	2,185	5,272	1,336	0	0	0	9,124

Description of CIP Changes: Project costs updated based on Consultant's opinion of probable construction cost dated February 2017 included in the Final Basis

of Design Report;

CIP Number: **114012**

Old CIP No.: 1320

Project Title: **SPW WTP Water Treatment Plant 1930 Filter Building-Roof Replacement**

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Springwells

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Review Committee Project Score: **61**

Filter Building roof

Project Significance: The existing roof over the 1930 filters is leaking in places and poses water quality concerns due to roof leaks.

Project Engineer/Manager: Paula Anderson

Manager: Paula Anderson

Scope of Work: This project encompasses replacement of the existing 1930 Filter Building roofing system, including the built-up roofing material, flashing, roof drains/conductors and sealing cap stones to prevent water from penetrating the building envelop and causing water damage. Construction activity under Contract SP-563 in 2014-2015 revealed that water damage has been on-going and is causing clerestory window lintel deterioration. Additionally, construction traffic under Contract SP-563 has shown the built-up material to be blistering and spongy.

Challenges: Seasonal construction work, and construction will require working around new rooftop equipment installed under SP-563.

Phase Expenses

PHASE **Design and Build** Contract No NA Phase Status Under Procurement

Phase Title Springwells Water Treatment Plant 1930 Filter Building-Roof Replacement

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	72	1,336	0	0	0	0	0

CIP Number: **114012**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
72	1,336	0	0	0	0	0

Phase Tasks and Dates

Phase Category	DB
Budget	Water
Phase Status	Under Procurement
Contract No	NA
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development	6/1/2017	215	1/2/2018
Procurement	1/3/2018	167	6/19/2018
Project Execution	6/20/2018	167	12/4/2018
Project Closeout	12/5/2018	83	2/26/2019

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		3,000							0	3,000
2019	0		72	1,336	0	0	0	0	0	1,408

Description of CIP Changes: Changes made due to delay in getting bid documents released for bidding purposes.

CIP Number: **114013**

Old CIP No.: 1389

Project Title: **SPW WTP Reservoir Fill Line Improvements**

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Springwells

Review Committee Project Score: **77.2**

☐ Innovation

☑ MP Right Sizin

☑ System Reliability

Springwells WTP

Project Significance: Reservoir fill line to Springwells is needed to provide finished water to the Springwells high service area from Southwest and Waterworks Park while the Springwells raw water tunnel is out of service for repairs and during times when the Springwells Low Lift Station is taken offline for inspections, repairs or maintenance.

Project Engineer/Manager: Erich Klun

Manager: Grant Gartrell

Scope of Work: Reservoir fill line to Springwells is needed to provide finished water to the Springwells high service area from Southwest and Waterworks Park while the Springwells raw water tunnel is out of service for repairs.

Challenges: Very complicated sequence of construction, and coordination with wholesale customers is required.

Phase Expenses

PHASE **Design & Construction Assistance** Contract No SCP-CS-038 Phase Status Active

Phase Title Springwells Reservoir Fill Line Improvements

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	97	162	0	0	0	0	0

CIP Number: **114013**

PHASE	Construction	Contract No		Phase Status	Future Planned Start
Phase Title	SPW WTP Reservoir Fill Line Improvements				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
500	6,500					

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
597	6,662	0	0	0	0	0

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	10/11/2016	419	12/4/2017
Procurement	12/5/2017	167	5/21/2018
Project Execution	5/22/2018	419	7/15/2019
Project Execution	7/16/2019	83	10/7/2019

Phase Category	D/CA
Budget	Water
Phase Status	Active
Contract No	SCP-CS-038
Cost Est Class	

Design & Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	10/11/2016	419	12/4/2017
Procurement	12/5/2017	167	5/21/2018
Project Execution	5/22/2018	419	7/15/2019
Project Execution	7/16/2019	83	10/7/2019

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		200	3,300	4,000					0	7,500
2019	0	120	597	6,662	0	0	0	0	0	7,379

Description of CIP Changes: Updated per current design developing under Consultant's design;

CIP Number: 114014

Old CIP No.: 1407

Project Title: SPW WTP Underground Fire Protection Loop Improvements

Project Status Reclassified

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Springwells

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Review Committee Project Score: 67.4

Fire protection loop schematic

Project Significance: Reclassified into Project 114005: Improvements will provide reliable fire protection to all plant facilities, replace non-functioning isolation valves and hydrants, provide fire system backflow protection, and bring the fire system into conformance with the requirements of the Dearborn Fire Marshal.

Project Engineer/Manager: Erich Klun

Manager: Grant Gartrell

Scope of Work: The existing underground fire protection line loops the Pump, Switch, Boiler and Turbine houses and is supplied water off the high lift headers in the Pump House Header Vault. The supply does not currently have backflow prevention and several branches off the loop used to feed an irrigation system serving the grassy areas covering the reservoirs, 1930 Sed. Basin and 1958 Sed. Basin. Isolation valves and fire hydrants are non-functioning and are beyond their useful life, and the old cast iron piping is susceptible to frequent breaks.

Challenges: The underground facilities (e.g., electrical duct banks, gas service mains, fiber optic, tunnels, conduits, major pipelines, etc.) at Springwells have been modified several times since initially being commissioned around 1930. The new fire loop will cross a lot of buried utilities and structures, and identification of these facilities and showing them accurately in Contract Documents will be

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title Springwells WTP Underground Fire Protection Loop Improvements

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	0	0	0	0	0	0

CIP Number: **114014**

PHASE	**Construction Assistance**	Contract No	NA	Phase Status	Future Planned Start

Phase Title: Springwells WTP Underground Fire Protection Loop Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

PHASE	**Design**	Contract No	NA	Phase Status	Future Planned Start

Phase Title: Springwells WTP Underground Fire Protection Loop Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

Phase Tasks and Dates

Phase Category: C
Budget: Water
Phase Status: Future Planned Start
Contract No: NA
Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Scope Development	1/8/2018	400	2/12/2019
Procurement	5/28/2019	180	11/24/2019
Project Execution	11/24/2019	250	7/31/2020
Project Closeout	7/31/2020	90	10/29/2020

Phase Category: CA
Budget: Water
Phase Status: Future Planned Start
Contract No: NA
Cost Est Class:

Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	1/8/2018	400	2/12/2019
Procurement	5/28/2019	180	11/24/2019
Project Execution	11/24/2019	250	7/31/2020
Project Closeout	7/31/2020	90	10/29/2020

CIP Number: **114014**

Phase Category	D
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Design

Task Name	Start Date	Duration	End Date
Scope Development	1/8/2018	400	2/12/2019
Procurement	5/28/2019	180	11/24/2019
Project Execution	11/24/2019	250	7/31/2020
Project Closeout	7/31/2020	90	10/29/2020

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			380	2,909					0	3,289
2019	0		0	0	0	0	0	0	0	0

Description of CIP Changes

CIP Number: 114015

Old CIP No.: 1412

Project Title: SPW WTP Emergency Grating Replacement

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Springwells

Review Committee Project Score: 100

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Deteriorated support beams holding up Low Lift Station. Dewatering and Sump Pumps at Elev. 42'-0" (left). Deteriorated grating and access ship's ladder in Low Lift Station - Looking down at Elev. 50'-0" and 42'-0" from Elev. 62'-0" (right).

Project Significance: Emergency replacement of original 1930 steel grating and structural steel in the Low Lift Station, Pump House Cable Vault and Garage basement (5 locations total).

Project Engineer/Manager: Erich Klun

Manager: Grant Gartrell

Scope of Work: Emergency replacement of original 1930 steel grating and structural steel in the Low Lift Station, Pump House Cable Vault and Garage basement (5 locations total).

Challenges: Maintaining system operations during construction and eliminating the potential for flooding the Low Lift Station during construction. LOTO of low lift pumping units for diver work associated with plugging the suction line to pump Nos. 9 and 10.

Phase Expenses

PHASE **Design and Build** Contract No NA Phase Status Active

Phase Title Emergency Grating Replacement at Springwells WTP

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,572	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,572	0	0	0	0	0	0

CIP Number: **114015**

Phase Tasks and Dates

Phase Category	DB
Budget	Water
Phase Status	Active
Contract No	NA
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development	10/1/2016	120	1/29/2017
Procurement	1/29/2017	90	4/29/2017
Project Execution	10/24/2017	223	6/4/2018
Project Closeout	6/5/2018	83	8/27/2018

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		500	2,000						0	2,500
2019	0	254	2,572	0	0	0	0	0	0	2,826

Description of CIP Changes

CIP Number: 115001

Old CIP No.: 1166

Project Title: WWP WTP Yard Piping, Valves and Venturi Meters Replacement

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Water Works Park

Review Committee Project Score: 65.4

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Pumps and Piping

Project Significance: Existing yard piping is 100 years old and requires replacement with new piping installed in a more efficient configuration.

Project Engineer/Manager: Timothy Kuhns

Manager: Grant Gartrell

Scope of Work: Much of the yard piping and valve system at Waterworks Park is old and at the end of its service life. Furthermore, the Water Treatment Plant does not have functioning production flow metering as the existing equipment is oversized and non-functioning. Replacement of the yard piping, valve, and metering system is needed at the site.

Challenges: Very complicated sequence of construction, and demands of DWSD-R must be maintained along with coordination with 84" between Water Works Park and Northeast WTPs. Condition of existing valves required to complete the work is unknown, and even though it is

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title WWP WTP Yard Piping, Valves and Venturi Meters Replacement

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
		1,208	25,172	25,158			

CIP Number: **115001**

PHASE	Study and Design and Construction Assistance	Contract No	CS-055	Phase Status	Active

Phase Title: CS-055, AECOM, WWP WTP Yard Piping, Valves and Venturi Meters Replacement

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,072	672	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,072	1,880	25,172	25,158	0	0	0

Phase Tasks and Dates

Phase Category: C
Budget: Water
Phase Status: Future Planned Start
Contract No: NA
Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Procurement	11/19/2018	165	5/3/2019
Project Execution	5/6/2019	725	4/30/2021
Project Closeout	5/3/2021	81	7/23/2021

Phase Category: S/D/CA
Budget: Water
Phase Status: Active
Contract No: CS-055
Cost Est Class:

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Procurement	11/19/2018	165	5/3/2019
Project Execution	5/6/2019	725	4/30/2021
Project Closeout	5/3/2021	81	7/23/2021

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			5,500	27,900	20,500				0	53,900
2019	0	9	2,072	1,880	25,172	25,158	0	0	0	54,291

Description of CIP Changes: Updated project expenses.

CIP Number: **115002**

Old CIP No.: 1274

Project Title: **WWP WTP Concrete and Road Improvements**

Project Status Closed

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

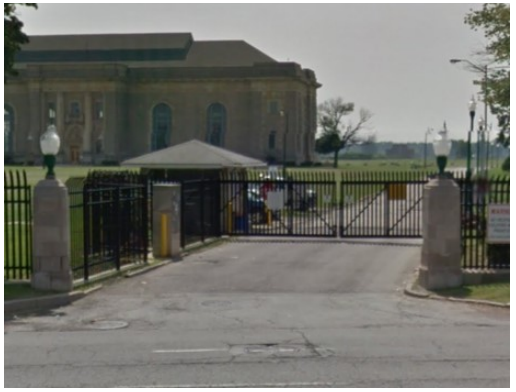
Classification Lvl 3: Water Works Park

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability



Waterworks Park WTP

Project Significance: Necessary concrete repairs to prevent further deterioration to critical treatment systems at Waterworks Park WTP

Project Engineer/Manager: Jorge Nicolas

Manager: Grant Gartrell

Scope of Work: This construction project involves repairing cracked and spalled concrete to stop water leaking from water-containing structures and process units (i.e., filter tanks, sedimentation basins, ozone contactors), re-constructing plant roadways and parking areas that have substantial pavement deterioration, and re-grading and re-paving the administration building parking area to improve drainage.

Challenges: N/A - Active

Phase Expenses

PHASE **Construction** Contract No WW-538 Phase Status Closed Out

Phase Title WWP WTP Concrete and Road Improvements

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond

CIP Number: **115002**

Phase Tasks and Dates

Phase Category	C	**Construction**
Budget	Water	
Phase Status	Closed Out	
Contract No	WW-538	
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	761	2,275							0	3,036
2019	3	1,948								1,951

Description of CIP Changes

CIP Number: 115003

Old CIP No.: 1301

Project Title: WWP WTP Comprehensive Condition Assessment

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Water Works Park

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Review Committee Project Score: 35.6

Waterworks Park WTP

Project Significance: A condition assessment of Waterworks Park Water Treatment Plant has not been completed since the 2004 reconstruction. Condition assessment is needed to identify critical assets in need of repair or replacement.

Project Engineer/Manager: Grant Gartrell

Manager: Grant Gartrell

Scope of Work: A condition assessment of Waterworks Park Water Treatment Plant has not been completed since the 2004 reconstruction. Continued and periodic inspection of the Water Treatment Plant is needed to maintain a reliable production system, especially given the reliance on Waterworks Park to provide finish water to the Northeast Service Area.

Challenges: Coordinating shutdowns required for condition assessment inspections.

Phase Expenses

PHASE **Study** Contract No NA Phase Status Active

Phase Title Comprehensive Condition Assessment at Waterworks Park WTP

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
321	296	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
321	296	0	0	0	0	0

CIP Number: **115003**

Phase Tasks and Dates

Phase Category	S
Budget	Water
Phase Status	Active
Contract No	NA
Cost Est Class	

Study

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	8/2/2017	730	8/2/2019
Project Closeout	8/5/2019	57	10/1/2019

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		200	375						0	575
2019	0		321	296	0	0	0	0	0	617

Description of CIP Changes: REVISED PER AWARDED CONTRACT CS-147 TO HRC.

CIP Number: 115004

Old CIP No.: 1410

Project Title: WWP WTP Chlorine System Upgrade

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: Water Works Park

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Review Committee Project Score: 84

The Water Works Park Chlorine System has experienced several leaks and requires complete replacement. The Water Works Park storage room will have an updated scrubber system to neutralize up to 4000 lbs of chlorine gas

Project Significance: WWP Chlorine System has experienced numerous leaks and has compromised the safety of plant

Project Engineer/Manager: Todd King

Manager: Grant Gartrell

Scope of Work: Demolition and replacement of all mechanical systems, equipment and piping related to chlorine transport, vaporization and application. New chlorine system will be able to meet current dose rates and be able to meet future loadings estimated for WWP after the Northeast WTP treatment system is taken off line.

Challenges: It will be critical for the contractor to phase the work to provide ongoing chlorine application during the retrofit.

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Under Procurement

Phase Title Water Works Park WTP Chlorine System Upgrade

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	935	8,904	0	0	0	0	0

CIP Number: **115004**

PHASE	Design & Construction Assistance	Contract No	CS-1721	Phase Status	Active
Phase Title	Water Works Park WTP Chlorine System Upgrade				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
935	8,904	0	0	0	0	0

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	Under Procurement
Contract No	NA
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	9/1/2017	45	10/16/2017
Procurement	10/17/2017	111	2/5/2018
Project Execution	2/6/2018	762	3/9/2020
Project Closeout	3/10/2020	90	6/8/2020

Phase Category	D/CA
Budget	Water
Phase Status	Active
Contract No	CS-1721
Cost Est Class	

Design & Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	9/1/2017	45	10/16/2017
Procurement	10/17/2017	111	2/5/2018
Project Execution	2/6/2018	762	3/9/2020
Project Closeout	3/10/2020	90	6/8/2020

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		290	700	8,700					0	9,690
2019	0	371	935	8,904	0	0	0	0	0	10,210

Description of CIP Changes

CIP Number: **116001**

Old CIP No.: 1292

Project Title: **WTP General Purpose Pennsylvania, Springwells and Northeast Raw Water Supply Tunnel Improvements**

Project Status Reclassified ☐ Innovation

Budget: Water ☐ MP Right Sizin

Classification Lvl 1: Water ☐ System Reliability

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: General Purpose

Review Committee Project Score:

Project Significance: PROJECT RECLASSIFED INTO 116002. Project critical to production at Springwells WTP during repurposing of Northeast WTP as recommended by the 2015 WMPU. Contract CS-1623 identified problem areas on the raw water supply system that compromised the system's ability to meet demands

Project Engineer/Manager: Todd King

Manager: Grant Gartrell

Scope of Work: The scope of this project is to address miscellaneous repairs identified as part of the ongoing raw water tunnel inspection project. The scope of these repairs is to rehabilitate structures within the tunnels, shafts and related appurtenances that are identified during the raw water tunnel inspections. Note: due to the scale of the repairs for the Springwells, Pennsylvania and Northeast Tunnels, a separate CIP project request was generated (CIP 1327).

Challenges: Maintaining a supply of raw water to Springwells, Northeast and Water Works Park throughout construction to meet finished water production requirements/demands of the system. Specialized/complicated construction.

Phase Expenses

PHASE **Design and Build** Contract No DB-150 Phase Status Under Procurement

Phase Title Miscellaneous Improvements to Raw Water Tunnels, Shafts and Related Structures

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	0	0	0	0	0	0

CIP Number: **116001**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

Phase Tasks and Dates

Phase Category	DB
Budget	Water
Phase Status	Under Procurement
Contract No	DB-150
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement	10/24/2017	97	1/29/2018
Project Execution	1/30/2018	1091	1/25/2021
Project Closeout	1/26/2021	83	4/19/2021

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			1,000	1,000	500				0	2,500
2019	0		0	0	0	0	0	0	0	0

Description of CIP Changes: Project has been reclassified into project 116002.

CIP Number: **116002**

Old CIP No.: 1327

Project Title: **Pennsylvania, Springwells and Northeast Raw Water Supply Tunnel Improvements**

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: General Purpose

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Crown cracks are especially concerning in the Springwells Raw Water Tunnel

Project Significance: Project critical to production at Springwells WTP during repurposing of Northeast WTP as recommended by the 2015 WMPU. Contract CS-1623 identified problem areas on the raw water supply system that compromised the system's ability to meet demands during the repurposing of Northeast WTP.

Project Engineer/Manager: Todd King

Manager: Grant Gartrell

Scope of Work: The scope of work is to conduct supplemental investigations to design the repairs for the sections of tunnel identified in CS-1623 as having structural concerns. Three areas were identified with the highest concern being a portion of the Springwells Tunnel near the Springwells WTP.

Challenges: The tunnels are approximately 80 feet below the surface of the Detroit River. This poses challenges for assessing the extent of damage to the structures, as well as repair. Dewatering the tunnels to repair them will create extensive stresses that must be considered prior to performing the work. Maintaining a supply of raw water to Springwells, Northeast and Water Works Park

Phase Expenses

PHASE **Design and Build** Contract No DB-150 Phase Status Active

Phase Title Pennsylvania, Springwells and Northeast Raw Water Supply Tunnel Improvements

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	4,673	14,673	20,246	401	0	0	

CIP Number: **116002**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
4,673	14,673	20,246	401	0	0	

Phase Tasks and Dates

Phase Category	DB
Budget	Water
Phase Status	Active
Contract No	DB-150
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement	10/24/2017	97	1/29/2018
Project Execution	1/30/2018	1091	1/25/2021
Project Closeout	1/26/2021	83	4/19/2021

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		500	2,000	10,000	15,000	4,900			0	32,400
2019	0	10	4,673	14,673	20,246	401	0	0		40,003

Description of CIP Changes: This project now includes CIP 116001 that was previously included in the CIP 2018-2022 with projected expenses of $2,5M.

CIP Number: **116003**

Old CIP No.: 1355

Project Title: **Genesee and Lapeer County Transmission System Improvements**

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Treatment Plants & Facilities

Classification Lvl 3: General Purpose

Review Committee Project Score: **54.6**

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Transmission main

Transmission main

Project Significance: Project critical to maintaining chlorine residual to customers connected to the 72" main feeding Flint and Genesee County and abandonment of the 72" main once Flint and Genesee County are off the system. Projects need to be substantially complete by July

Project Engineer/Manager: Todd King

Manager: Grant Gartrell

Scope of Work: With the departure of Flint and Genesee County from the GLWA system, the water age in the 72-inch transmission main increases to levels where minimum chlorine residuals cannot be maintains. Chlorine booster stations are needed along the 72-inch transmission main to maintain acceptable chlorine residuals.

Challenges: Live tapping and line stops on 72" PCCP required for both projects and is specialized construction. Work requires close coordination with operations to meet pressure requirements required to tap the pipe.

Phase Expenses

PHASE **Design and Build** Contract No DBW-070 Phase Status Active

Phase Title Genesee and Lapeer County Transmission System Improvements

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	3,672	0	0	0	0	0	0

CIP Number: **116003**

PHASE	**Design**	Contract No	NA	Phase Status	Future Planned Start
Phase Title	Genesee and Lapeer County Transmission System Improvements				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
3,672	0	0	0	0	0	0

Phase Tasks and Dates

Phase Category	D
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Design

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Phase Category	DB
Budget	Water
Phase Status	Active
Contract No	DBW-070
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			400	3,200	3,200				0	6,800
2019	0		3,672	0	0	0	0	0	0	3,672

Description of CIP Changes: UPDATED PER DBW-070 CONTRACT STATUS

CIP Number: 116004

Old CIP No.:

Project Title: WTP Right-Sizing Implementation Plan

Project Status	New	☐	Innovation
Budget:	Water	☑	MP Right Sizin
Classification Lvl 1:	Water	☑	System Reliability
Classification Lvl 2:	Treatment Plants & Facilities		
Classification Lvl 3:	General Purpose		

Review Committee Project Score: 33.4

Make a plan

Project Significance: The 2015 WMPU identified the need to align water treatment plant capacity with system water demands. The installed design water treatment capacity is 1720 MGD whereas the system demands have not been greater than 1000 MGD for several years. Moreover, 20-year water demand projections indicate that future demands will not exceed 1000 to 1100 MGD for the next 20 years. The purpose of this project is to retain an expert firm to work closely with GLWA operations and engineering staff to develop a practical and specific plan to reduce the capacity of the 4 water treatment plants to remain after Northeast WTP is decommissioned. Additionally, this planning project will identify a tactical plan to reduce treatment capacity at these 4 plants while Northeast is still in service so that un-necessary capital investments are not made at the remaining 4 plants.

Project Engineer/Manager: TBD

Manager: Grant Gartrell

Scope of Work: Engineering study project that will generally involve:
1. project management
2. data analysis, facility & process analysis
3. hydraulic plant profiling
4. operations review
5. staff interviews
6. facility process & operations mapping
7. tactical planning
8. implementation planning
9. reporting

Challenges:

CIP Number: **116004**

Phase Expenses

PHASE **Study** Contract No Phase Status New

Phase Title WTP Right-Sizing Implementation Plan

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
547	1,645					

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
547	1,645					

Phase Tasks and Dates

Phase Category S

Budget Water

Phase Status New

Contract No

Cost Est Class

Study

Task Name	Start Date	Duration	End Date
Scope Development	2/2/2018	56	3/30/2018
Procurement	4/2/2018	361	3/29/2019
Project Execution	4/1/2019	361	3/27/2020
Project Closeout	3/30/2020	81	6/19/2020

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2019	0		547	1,645						2,192

Description of CIP Changes

CIP Number: **122001**

Old CIP No.: 1112

Project Title: **Parallel 42-Inch Main in 24 Mile Road from Rochester Station to Romeo Plank Road**

Project Status Pending Closeout

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Field Services

Classification Lvl 3: Transmission System

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☑ System Reliability

A large water main

Project Significance: Paralleling original 36” water main that is critical to the supply of three communities and has had history of breaks

Project Engineer/Manager: Eric Kramp

Manager: Grant Gartrell

Scope of Work: This project will provide for the installation of approximately 35,650 feet of parallel 42-inch diameter pre-stressed embedded concrete cylinder pipe (PCCP) and approximately 1,070 linear feet of 36-inch diameter of PCCP in 24 Mile Road from Rochester Station to Romeo Plank Road. The work will also provide for all interconnections and valves.

Challenges: N/A - Pending Closeout

Phase Expenses

PHASE **Construction** Contract No WS-681 Phase Status Pending Close-out

Phase Title Parallel 42-Inch Main in 24 Mile Road from Rochester Station to Romeo Plank Road

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
821	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
821	0	0	0	0	0	0

CIP Number: **122001**

Phase Tasks and Dates

Phase Category	C	**Construction**
Budget	Water	
Phase Status	Pending Close-out	
Contract No	WS-681	
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	26,926	2,367	715						0	30,008
2019	30,960	1,611	821	0	0	0	0	0	0	33,392

Description of CIP Changes: $500,000 claim negotiation settled out in allowance

CIP Number: **122002**

Old CIP No.: 1216

Project Title: **Replacement of Five (5) PRV Pits of Treated Water Transmission System**

Project Status Pending Closeout

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Field Services

Classification Lvl 3: Transmission System

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

An example PRV

Project Significance: Replacement of the PRVs to enhance operability of the system and improve control of the system to meet customer pressure needs

Project Engineer/Manager: Eric Kramp

Manager: Grant Gartrell

Scope of Work: This project will replace five existing pressure reducing valves (PRVs) that are defective and no longer controlling downstream pressures. During the replacement, the PRV pits will be upgraded to improve accessibility, provide new sump pumps as needed, and make other necessary improvements.

Challenges: N/A - Active

Phase Expenses

PHASE **Construction** Contract No DWS-891 Phase Status Pending Close-out

Phase Title Replacement of Five (5) PRV Pits of Treated Water Transmission System

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
794	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
794	0	0	0	0	0	0

CIP Number: **122002**

Phase Tasks and Dates

Phase Category	C	**Construction**
Budget	Water	
Phase Status	Pending Close-out	
Contract No	DWS-891	
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	1,015	1,205							0	2,220
2019	1,086	611	794	0	0	0	0	0	0	2,491

Description of CIP Changes: $770,000 claim negotiation included in project expenses.

CIP Number: **122003**

Old CIP No.: 1305

Project Title: **Waterworks Park WTP to Northeast WTP Transmission Main**

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Field Services

Classification Lvl 3: Transmission System

Review Committee Project Score: **62.4**

- ☐ Innovation
- ☑ MP Right Sizin
- ☑ System Reliability

NONE

Project Significance: New Transmission System needed to convey finish water to re-purposed Northeast WTP.

Project Engineer/Manager: Timothy Kuhns

Manager: Grant Gartrell

Scope of Work: GLWA system has excess treatment capacity. In order to right-size system capacity and avoid future treatment upgrade, treatment is to be discontinued at the Northeast WTP. In order to discontinue treatment at Northeast, a new finish water supply from Waterworks Park to Northeast is needed.

Challenges: Route determination, utility conflicts and connections to yard piping at Northeast and Water Works Park WTPs. The large new main will cross I-94 and run through 7 miles of residential/commercial streets.

Phase Expenses

PHASE **Design and Build** | Contract No NA | Phase Status Future Planned Start

Phase Title New Waterworks Park to Northeast Transmission Main

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	6,650	20,072	35,072	34,072	32,072	0

CIP Number: **122003**

PHASE **Study** | Contract No CS-152 | Phase Status Active

Phase Title New Waterworks Park to Northeast Transmission Main

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,500	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,500	6,650	20,072	35,072	34,072	32,072	0

Phase Tasks and Dates

Phase Category DB

Budget Water

Phase Status Future Planned Start

Contract No NA

Cost Est Class

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development	9/11/2018	27	10/8/2018
Procurement	10/9/2018	307	8/12/2019
Project Execution	8/13/2019	1455	8/7/2023
Project Closeout	8/8/2023	83	10/30/2023

Phase Category S

Budget Water

Phase Status Active

Contract No CS-152

Cost Est Class

Study

Task Name	Start Date	Duration	End Date
Scope Development	9/11/2018	27	10/8/2018
Procurement	10/9/2018	307	8/12/2019
Project Execution	8/13/2019	1455	8/7/2023
Project Closeout	8/8/2023	83	10/30/2023

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			1,500	5,000	10,000	38,000	38,000	37,500	0	130,000
2019	0	19	2,500	6,650	20,072	35,072	34,072	32,072	0	130,457

Description of CIP Changes Updated Expenses

CIP Number: 122004

Old CIP No.: 1321

Project Title: 96-inch Main Relocation, Isolation Valves Installations, and New Parallel Main

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Field Services

Classification Lvl 3: Transmission System

Review Committee Project Score: 65.2

- ☐ Innovation
- ☐ MP Right Sizin
- ☑ System Reliability

Map of the 96-inch main relocation away from the landfill

Project Significance: Project critical to providing redundancy to Lake Huron WTP supply and protection of water supply from potential contamination. Project includes relocation around existing landfill and addition of a parallel main with interconnection to meters between Romeo and 24 Mile Road.

Project Engineer/Manager: Grant Gartrell

Manager: Grant Gartrell

Scope of Work: Relocate 2.5 miles of 96-inch transmission main currently located in an EPA NPL landfill, a portion of which is submerged in landfill leachate. Relocation includes crossing the Clinton River, coordination with many various authorities having jurisdiction and easement acquisition. Isolation valve installation portion of the project provides the ability to isolate segments of the 96-inch main between Imlay Station and North Service Center for maintenance while maintaining customer expected level of service.

Challenges: Shutdown, isolation and live tapping of the 96" main while maintaining the Lake Huron WTP supply and operations of Rochester Station. Routing and possible property acquisition for both the parallel main and relocation around the landfill.

Phase Expenses

PHASE **Construction** | Contract No NA | Phase Status Future Planned Start

Phase Title 96-inch Main Relocation, Isolation Valves Installations, and New Parallel Main

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	0	5,059	18,963	47,721	41,771	5,969

CIP Number: **122004**

PHASE **Design & Construction Assistance** Contract No NA Phase Status Future Planned Start

Phase Title 96-inch Main Relocation, Isolation Valves Installations, and New Parallel Main

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
1,690	3,721	1,269	2,000	2,000	2,000	500

PHASE **Study** Contract No CS-165 Phase Status Active

Phase Title 96-inch Main Relocation, Isolation Valves Installations, and New Parallel Main

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
1,690	3,721	6,328	20,963	49,721	43,771	6,469

Phase Tasks and Dates

Phase Category C

Budget Water

Phase Status Future Planned Start

Contract No NA

Cost Est Class

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement	9/18/2019	187	3/23/2020
Project Execution	3/25/2020	1273	9/19/2023
Project Closeout	9/20/2022	83	12/12/2022

Phase Category D/CA

Budget Water

Phase Status Future Planned Start

Contract No NA

Cost Est Class

Design & Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement	9/18/2019	187	3/23/2020
Project Execution	3/25/2020	1273	9/19/2023
Project Closeout	9/20/2022	83	12/12/2022

CIP Number: **122004**

Phase Category	S
Budget	Water
Phase Status	Active
Contract No	CS-165
Cost Est Class	

Study

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement	9/18/2019	187	3/23/2020
Project Execution	3/25/2020	1273	9/19/2023
Project Closeout	9/20/2022	83	12/12/2022

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		500	1,500	6,000	35,900	31,700	31,700	31,700	0	139,000
2019	0	460	1,690	3,721	6,328	20,963	49,721	43,771	6,469	133,123

Description of CIP Changes

CIP Number: 122005

Old CIP No.: 1323

Project Title: Transmission System Water Main Work - Replacement of Schoolcraft Water Main

Project Status Future Planned

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Field Services

Classification Lvl 3: Transmission System

Review Committee Project Score: 42

☐ Innovation

☐ MP Right Sizin

☑ System Reliability

Water main replacement

Project Significance: Improving transmission system reliability and redundancy

Project Engineer/Manager: Eric Kramp

Manager: Grant Gartrell

Scope of Work: Design work of 10,800 of new 48-inch transmission main along I-96 under the freeway service drive between Middlebelt and Beech Daly. Due to excessive breaks the Schoolcraft water main in Redford/Livonia will be replaced. The purpose is to improve the transmission system reliability/redundancy.

Challenges:

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title Transmission System Water Main Work - Replacement of Schoolcraft Water Main

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
72	72	6,822	6,822	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
72	72	6,822	6,822	0	0	0

CIP Number: **122005**

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	9/7/2009	3399	12/28/2018
Procurement	12/31/2018	179	6/28/2019
Project Execution	7/1/2019	725	6/25/2021
Project Closeout	6/28/2021	81	9/17/2021

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018				7,300	7,250				0	14,550
2019	0		72	72	6,822	6,822	0	0	0	13,788

Description of CIP Changes: Added prioritization data and costs; updated schedule to make realistic with status of design completion and information still needed to figure out the sequencing of the project.

CIP Number: 122006

Old CIP No.: 1324

Project Title: Transmission System Water Main Work-Wick Road Parallel Water Main

Project Status Future Planned

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Field Services

Classification Lvl 3: Transmission System

Review Committee Project Score: 54.2

☐ Innovation

☐ MP Right Sizin

☑ System Reliability

Transmission main

Project Significance: Placement of parallel water main to minimize service disruptions to customer communities

Project Engineer/Manager: Eric Kramp

Manager: Grant Gartrell

Scope of Work: Construction of the new 48-inch transmission main along a principal roadway in Romulus. Original water main from Wick station to Ypsilanti station has history of excessive breaks. Additionally, the main is the only principal connection between the two facilities with multiple community Master Meters along its length. A break in this line is disruptive to several communities dependent upon this supply line. The purpose is to improve the transmission system reliability/redundancy.

Challenges: May require shut down of large transmission mains.

Phase Expenses

PHASE **Construction** Contract No CS-1448 Phase Status Future Planned Start

Phase Title CS-1488 TASK 4, Transmission System Water Main Work-Wick Road Parallel Water Main

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
72	5,072	7,072	5,036	0	0	0

CIP Number: **122006**

PHASE	Construction Assistance	Contract No	CS-1488	Phase Status	Future Planned Start

Phase Title: CS-1488 TASK 7, Transmission System Water Main Work-Wick Road Parallel Water Main

Phase Total

PHASE	Design	Contract No	CS-1488	Phase Status	Active

Phase Title: CS-1488, Transmission System Water Main Work-Wick Road Parallel Water Main

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
72	5,072	7,072	5,036	0	0	0

Phase Tasks and Dates

Phase Category: C
Budget: Water
Phase Status: Future Planned Start
Contract No: CS-1448
Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Scope Development	9/3/2009	3240	7/18/2018
Procurement	7/19/2018	181	1/16/2019
Project Execution	1/17/2019	727	1/13/2021
Project Closeout	1/14/2021	89	4/13/2021

Phase Category: CA
Budget: Water
Phase Status: Future Planned Start
Contract No: CS-1488
Cost Est Class:

Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	9/3/2009	3240	7/18/2018
Procurement	7/19/2018	181	1/16/2019
Project Execution	1/17/2019	727	1/13/2021
Project Closeout	1/14/2021	89	4/13/2021

CIP Number: **122006**

Phase Category	D
Budget	Water
Phase Status	Active
Contract No	CS-1488
Cost Est Class	

Design

Task Name	Start Date	Duration	End Date
Scope Development	9/3/2009	3240	7/18/2018
Procurement	7/19/2018	181	1/16/2019
Project Execution	1/17/2019	727	1/13/2021
Project Closeout	1/14/2021	89	4/13/2021

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		10,000	9,350						0	19,350
2019	0	23	72	5,072	7,072	5,036	0	0	0	17,275

Description of CIP Changes: Added prioritization information and project expenses.

CIP Number: 122007

Old CIP No.: 1326

Project Title: Hannon Road Transmission Main

Project Status Future Planned

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Field Services

Classification Lvl 3: Transmission System

Review Committee Project Score: 57

- ☐ Innovation
- ☑ MP Right Sizin
- ☑ System Reliability

Water main installation

Project Significance: Project identified in the 2015 Water Master Plan Update; improves system reliability, redundancy, and provides operational savings. It was also identified in the 2015 WMPU that this project is a predecessor project to decommissioning the Michigan Avenue Booster Station.

Project Engineer/Manager: Eric Kramp

Manager: Grant Gartrell

Scope of Work: This project involves design and construction services associated with the installation of 3 miles of new 24-inch transmission main along Hannon Road.

Challenges:

Phase Expenses

PHASE **Construction** | Contract No NA | Phase Status Future Planned Start

Phase Title Hannon Road Transmission Main

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	500	2,250	2,250	2,250	2,250	500

PHASE **Design & Construction Assistance** | Contract No NA | Phase Status Future Planned Start

Phase Title Hannon Road Transmission Main

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
36	72	72	72	72	72	72

CIP Number: **122007**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
36	572	2,322	2,322	2,322	2,322	572

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date	
Project Execution	1/28/2019	1718	10/12/2023	-

Phase Category	D/CA
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Design & Construction Assistance

Task Name	Start Date	Duration	End Date	
Project Execution	1/28/2019	1718	10/12/2023	-

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			1,800	2,200					0	4,000
2019	0		36	572	2,322	2,322	2,322	2,322	572	10,468

Description of CIP Changes: Updated prioritization, expenses

CIP Number: **122009**

Old CIP No.: 1350

Project Title: **Water System Improvements in Joy Road from Southfield Road to Trinity**

Project Status Pending Closeout

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Field Services

Classification Lvl 3: Transmission System

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☑ System Reliability

Water main being laid

Project Significance: Replacement of original piping with excessive break history with new ductile iron main along Wayne County roadway.

Project Engineer/Manager: Khader Hamad

Manager: Grant Gartrell

Scope of Work: The work consists of replacement of existing distribution mains and existing 24-inch transmissions mains, including gate valve, blow offs, air release valves and other appurtenances along Joy Road from Southfield Freeway to Trinity Road in the City of Detroit. A portion of this work is part of the Retail system (not included in this amount) CIP No. 463. Joy Road is also a significant Wayne County roadway within Detroit and a DDOT bus route.

Challenges: N/A - Pending Closeout

Phase Expenses

PHASE **Construction** Contract No WS-693 Phase Status Pending Close-out

Phase Title Water System Improvements in Joy Road from Southfield Road to Trinity

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

CIP Number: **122009**

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	Pending Close-out
Contract No	WS-693
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	8,323	100							0	8,423
2019	101	6	0	0	0	0	0	0	0	107

Description of CIP Changes: Change project Manager; This is done by DWSD

CIP Number: **122010**

Old CIP No.: 1351

Project Title: **Water Main Replacement within the City of Detroit - Joy Rd from Greenfield to Schaefer and Davison Ave from Lindwood to Livernois**

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Field Services

Classification Lvl 3: Transmission System

Review Committee Project Score:

- ☐ Innovation
- ☐ MP Right Sizin
- ☑ System Reliability

Water main being replaced

Project Significance: Original piping has history of excessive breaks; replacing to minimize disruption in high-traffic area

Project Engineer/Manager: Eric Kramp

Manager: Grant Gartrell

Scope of Work: Work includes replacement of approx. 18500 ft. of existing water main with 8", 12", and 16" DI pipe along both Joy Rd and Davison. The scope of work also includes approx. 5300 ft. of 24" DI pipe along Joy Rd. A portion of this work is part of the Retail system (amounts not included) CIP No. 463.

Challenges: N/A - Active

Phase Expenses

PHASE **Construction** | Contract No WS-693 | Phase Status Pending Close-out

Phase Title Water Main Replacement within the City of Detroit - Joy Rd from Greenfield to Schaefer and Davison Ave from Lindwood to Livernois

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,679	220	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,679	220	0	0	0	0	0

CIP Number: **122010**

Phase Tasks and Dates

Phase Category	C	**Construction**
Budget	Water	
Phase Status	Pending Close-out	
Contract No	WS-693	
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		1,370	1,106	652					0	3,128
2019	0		2,679	220	0	0	0	0	0	2,899

Description of CIP Changes

CIP Number: 122011

Old CIP No.: 1403

Project Title: Park-Merriman Water Main-Final Phase

Project Status Future Planned

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Field Services

Classification Lvl 3: Transmission System

Review Committee Project Score: 30.2

☐ Innovation

☐ MP Right Sizin

☑ System Reliability

Water main being installed

Project Significance: Replacement of new water main to convert deduct water meters to direct connection meters

Project Engineer/Manager: Eric Kramp

Manager: Grant Gartrell

Scope of Work: This third and final leg of the 24" water main project will convert a handful of GLWA Master Meters from a deduct to direct connection service and retire Master Meter WY-01 in favor of two new Master Meter vaults.

Challenges: n/a

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title Park-Merriman Water Main-Final Phase

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
72	3,145	3,072	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
72	3,145	3,072	0	0	0	0

CIP Number: **122011**

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	10/24/2017	286	8/6/2018
Procurement	8/7/2018	209	3/4/2019
Project Execution	3/5/2019	727	3/1/2021
Project Closeout	3/2/2021	83	5/24/2021

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			1,800	2,200					0	4,000
2019	0		72	3,145	3,072	0	0	0	0	6,289

Description of CIP Changes

CIP Number: **122012**

Old CIP No.: 1404

Project Title: **36-inch Water Main in Telegraph Road**

Project Status Pending Closeout

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Field Services

Classification Lvl 3: Transmission System

Review Committee Project Score: **45.6**

☐ Innovation

☐ MP Right Sizin

☑ System Reliability

Water main ready to install

Project Significance: Excessive joint leaks warrant replacement; new water line to be placed in greenbelt

Project Engineer/Manager: Eric Kramp

Manager: Grant Gartrell

Scope of Work: This project includes installation of approximately 10,530 feet of 36-inch dia. water main in Telegraph Road from Cherry Hill to Warren Ave.

Challenges: N/A - Active

Phase Expenses

PHASE **Construction** Contract No WS-684A Phase Status Pending Close-out

Phase Title 36-inch Water Main in Telegraph Road

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,036	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,036	0	0	0	0	0	0

CIP Number: **122012**

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	Pending Close-out
Contract No	WS-684A
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Project Execution	10/24/2017	139	3/12/2018
Project Closeout	3/13/2017	83	6/4/2017

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		2,000	5,061						0	7,061
2019	580	7,545	2,036	0	0	0	0	0	0	10,161

Description of CIP Changes: Updated prioritization, project expenses. Total construction cost ~$8.9M. Only restoration and retainage remain for estimated amount of $1.2M.

CIP Number: **122013**

Old CIP No.: 1405

Project Title: **14 Mile Transmission Main Loop**

Project Status	Future Planned	☐	Innovation
Budget:	Water	☐	MP Right Sizin
Classification Lvl 1:	Water	☑	System Reliability
Classification Lvl 2:	Facilities		
Classification Lvl 3:	Transmission System		

Review Committee Project Score: **58.4**

Project Significance: The 14 Mile Transmission Main that currently serves West Bloomfield Township, Farmington Hills, Commerce Township, Novi, Walled Lake, and Wixom is a single feed transmission system. If a disruption to service were to occur on this transmission main, many of the users along this main would experience a complete loss of pressure and flow. This project would provide a transmission main loop to the 14 Mile system to increase redundancy on this branch of the system.

Project Engineer/Manager: Timothy Kuhns

Manager: Grant Gartrell

Scope of Work: Install approximately 6 Miles of 48-inch transmission main from 8 Mile Road to 14 Mile Road along Haggerty Road. The work will also include connections to the yard piping and reservoir fill line at the Haggerty Booster Station as well as a control valve to regulate flows along the transmission main.

Challenges: Routing and construction staging for the proposed piping in the vicinity of the Haggerty and 8 Mile Intersection appears to be a significant challenge as this intersection is one of the highest traffic volume intersections in Southeast Michigan.

Phase Expenses

PHASE **Design & Construction Assistance** Contract No Phase Status Future Planned Start

Phase Title 14 Mile Transmission Main Loop

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	60	1,731	1,028	714	714	715	238

CIP Number: **122013**

PHASE	Construction	Contract No		Phase Status	Future Planned Start
Phase Title	14 Mile Transmission Main Loop				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
		2,388	10,901	18,904	14,004	3,388

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
60	1,731	3,416	11,615	19,618	14,719	3,626

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	7/1/2019	121	10/30/2019
Procurement	10/31/2019	167	4/15/2020
Project Execution	5/16/2020	1243	10/11/2023
Project Closeout	10/12/2023	83	1/3/2024

Phase Category	D/CA
Budget	Water
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Design & Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	7/1/2019	121	10/30/2019
Procurement	10/31/2019	167	4/15/2020
Project Execution	5/16/2020	1243	10/11/2023
Project Closeout	10/12/2023	83	1/3/2024

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		1,300	10,500	12,000	6,000				0	29,800
2019	0		60	1,731	3,416	11,615	19,618	14,719	3,626	54,785

Description of CIP Changes

CIP Number: **122014**

Old CIP No.: 1230b

Project Title: **Romulus 48-inch Water Main Installation**

Project Status Pending Closeout

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Field Services

Classification Lvl 3: Transmission System

Review Committee Project Score:

- ☐ Innovation
- ☑ MP Right Sizin
- ☑ System Reliability

Pipe ready to install

Project Significance: Placement of a parallel water main to minimize service disruptions to customer communities

Project Engineer/Manager: Khader Hamad

Manager: Grant Gartrell

Scope of Work: The City of Romulus notified DWSD of a significant retail development opening in Autumn 2016 at the southeast corner of Vining and Wick Roads. Romulus was also aware that DWSD has a project pending to place a 48" water main along Wick Road. Placement of the new 48" water main would be disruptive to the retail development traffic entrances/exits facing Wick road. Thus, Romulus asked if the 48" water main project could be expedited so it could be in place at the time of the retail development construction in Spring/Summer 2016. The 48" water main will be placed by Romulus as a part of the pavement upgrade work being pursued by Romulus early in 2016.

Challenges: N/A - Active

Phase Expenses

PHASE **Construction** Contract No MOU-4848 Phase Status Pending Close-out

Phase Title Romulus 48-inch Water Main Installation

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond

CIP Number: **122014**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond

Phase Tasks and Dates

Phase Category	C	**Construction**
Budget	Water	
Phase Status	Pending Close-out	
Contract No	MOU-4848	
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	1,021	3,514							0	4,535
2019	436	3,404								3,840

Description of CIP Changes

CIP Number: **122015**

Old CIP No.: 1230c

Project Title: **30" Water main Replacement - Water main Replacement Under Jefferson & Rouge River**

Project Status Closed

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Field Services

Classification Lvl 3: Transmission System

- ☐ Innovation
- ☐ MP Right Sizin
- ☑ System Reliability

Water main

Review Committee Project Score:

Project Significance:

Project Engineer/Manager: Eric Kramp

Manager: Grant Gartrell

Scope of Work:

Challenges:

Phase Expenses

PHASE **Construction** Contract No CON-105 Phase Status Closed Out

Phase Title 30" Water main Replacement - Water main Replacement Under Jefferson & Rouge River

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond

CIP Number: **122015**

Phase Tasks and Dates

Phase Category	C	**Construction**
Budget	Water	
Phase Status	Closed Out	
Contract No	CON-105	
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		2,327							0	2,327
2019	0	2,345								2,345

Description of CIP Changes

CIP Number: 122016

Old CIP No.:

Project Title: Downriver Transmission Main Loop

Project Status	New
Budget:	Water
Classification Lvl 1:	Water
Classification Lvl 2:	Facilities
Classification Lvl 3:	Transmission System

- ☐ Innovation
- ☐ MP Right Sizin
- ☑ System Reliability

Review Committee Project Score: 58.4

Example transmission main

Project Significance: The Downriver Transmission Main that currently serves Brownstown, Riverview, Woodhaven, Trenton, Flat Rock, Gibraltar, Rockwood, South Rockwood, and Berlin Township is a single feed transmission system. If a disruption to service were to occur on this transmission main, many of the users along this main would experience a complete loss of pressure and flow. This project would provide a transmission main loop to the Downriver system to increase redundancy on this branch of the system.

Project Engineer/Manager: Timothy Kuhns

Manager: Grant Gartrell

Scope of Work: Install approximately 6 Miles of 16-inch transmission main and 3 Miles of 24-inch transmission main from along the Electric Avenue corridor to parallel the existing transmission system in this branch of the system.

Challenges: Assuming ownership of the 24-inch transmission main through the City of Trenton may require condition assessment of this portion of pipeline.

Phase Expenses

PHASE **Design & Construction Assistance** Contract No Phase Status New

Phase Title Downriver Transmission Main Loop

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	121	121	640	733	435	435	798

CIP Number: **122016**

PHASE	Construction	Contract No		Phase Status	New
Phase Title	Downriver Transmission Main Loop				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
		80	1,512	5,436	9,754	17,904

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
121	121	720	2,245	5,871	10,189	18,702

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	New
Contract No	
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	7/1/2020	110	10/19/2020
Procurement	10/20/2020	167	4/5/2021
Project Execution	4/6/2021	1455	3/31/2025
Project Closeout	4/1/2025	83	6/23/2025

Phase Category	D/CA
Budget	Water
Phase Status	New
Contract No	
Cost Est Class	

Design & Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	7/1/2020	110	10/19/2020
Procurement	10/20/2020	167	4/5/2021
Project Execution	4/6/2021	1455	3/31/2025
Project Closeout	4/1/2025	83	6/23/2025

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2019	0		121	121	720	2,245	5,871	10,189	18,702	37,969

Description of CIP Changes

CIP Number: **132001**

Old CIP No.: 1047

Project Title: **Wick PS - Rehabilitation**

Project Status Pending Closeout

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Wick Road Station

Project Significance: Provides improved control on the far-western portion of the transmission system.

Project Engineer/Manager: Eric Kramp

Manager: Grant Gartrell

Scope of Work: Rehab 3 pumps and added VFDs and related controls system upgrades

Challenges: Complicated control programming of VFDs and HVAC system.

Phase Expenses

PHASE **Design and Build** Contract No DWS-858 Phase Status Pending Close-out

Phase Title Wick Road Station Rehabilitation

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
200	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
200	0	0	0	0	0	0

CIP Number: **132001**

Phase Tasks and Dates

Phase Category	DB
Budget	Water
Phase Status	Pending Close-out
Contract No	DWS-858
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	13,452	250							0	13,702
2019	0		200	0	0	0	0	0	0	200

Description of CIP Changes: Project Manager Eric Kramp/Grant Gartrell

CIP Number: **132002**

Old CIP No.: 1226

Project Title: **Joy PS - Replace Switchgear**

Project Status Closed

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: SCC

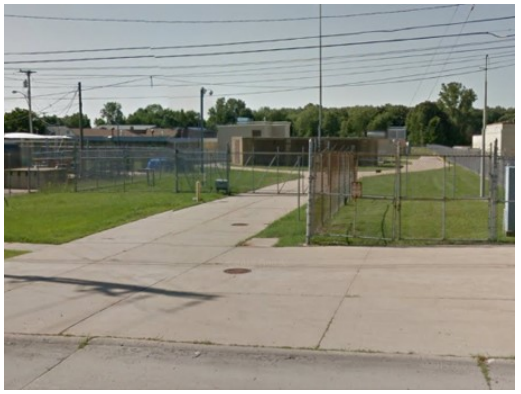
Classification Lvl 3: Pump Station/Reservoir

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability



Joy Road Pumping Station

Project Significance:

Project Engineer/Manager:

Manager:

Scope of Work:

Challenges:

Phase Expenses

PHASE **Construction** Contract No Phase Status Closed Out

Phase Title Joy PS - Replace Switchgear

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond

CIP Number: **132002**

Phase Tasks and Dates

Phase Category	C	**Construction**
Budget	Water	
Phase Status	Closed Out	
Contract No		
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	611	1							0	612
2019	641	28								669

Description of CIP Changes

CIP Number: **132003**

Old CIP No.: 1270

Project Title: **West Service Center PS - Isolation Gate Valves for Line Pumps**

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Review Committee Project Score: **70.8**

☐ Innovation

☐ MP Right Sizin

☑ System Reliability

Isolation gate valves

Project Significance: Project needed to provide isolation of the existing pumping units from the distribution and transmission system during pumping unit and discharge flow control valve maintenance. Existing conditions require three pumping units to be taken out of service to

Project Engineer/Manager: Timothy Kuhns

Manager: Grant Gartrell

Scope of Work: Currently there is no means to isolate individual pumping units at the West Service Center. Maintenance on individual units require taking out entire high or intermediate pumping systems without isolation valves.

Challenges: Sequence of construction and meeting system demands will need to be coordinated with operations and on-going work to repurpose the Northeast WTP.

Phase Expenses

PHASE **Construction** Contract No Phase Status Future Planned Start

Phase Title Isolation Gate Valves for Line Pumps for West Service Center Pumping Station

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	41	1,368					

CIP Number: **132003**

PHASE	Design & Construction Assistance	Contract No	NA	Phase Status	Active

Phase Title: Isolation Gate Valves for Line Pumps for West Service Center Pumping Station

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
65	1,465	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
106	2,833	0	0	0	0	0

Phase Tasks and Dates

Phase Category: C
Budget: Water
Phase Status: Future Planned Start
Contract No:
Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date	
Scope Development	10/24/2017	125	2/26/2018	-
Procurement	2/27/2018	181	8/27/2018	-
Project Execution	8/28/2018	279	6/3/2019	-
Project Closeout	6/4/2019	83	8/26/2019	-

Phase Category: D/CA
Budget: Water
Phase Status: Active
Contract No: NA
Cost Est Class:

Design & Construction Assistance

Task Name	Start Date	Duration	End Date	
Scope Development	10/24/2017	125	2/26/2018	-
Procurement	2/27/2018	181	8/27/2018	-
Project Execution	8/28/2018	279	6/3/2019	-
Project Closeout	6/4/2019	83	8/26/2019	-

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			521	1,000					0	1,521
2019	0	66	106	2,833	0	0	0	0	0	3,005

Description of CIP Changes: Updated Project Expenses

CIP Number: 132004

Old CIP No.: 1271

Project Title: North Service Center PS - Hydraulic Surge Control

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Review Committee Project Score: 28.2

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Observed pressure data from meter at the border of Warren and Madison Heights.

Project Significance: Madison Heights, Troy, and Sterling Heights experience pressure spikes from the suction side of the North Service Center when line pumps trip. Hydraulic transient study is needed to identify the most cost effective solution to mitigate the pressure spikes

Project Engineer/Manager: Timothy Kuhns

Manager: Grant Gartrell

Scope of Work: In recent years, the North Service Center has experienced power failures resulting in pump trips at the facility. The pump trips have caused high pressure transients along the transmission mains serving Madison Heights, Sterling Heights, Troy, Warren, Fraser, Clinton Township, and Roseville. The proposed project involves the study of control measures to mitigate the hydraulic transients present within the system.

Challenges: Coordination with operations and customers necessary to complete the work.

Phase Expenses

PHASE **Design & Construction Assistance** Contract No NA Phase Status Future Planned Start

Phase Title Hydraulic Surge Control for North Service Center Pumping Station

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	23	189	472	0	0	0	0

CIP Number: **132004**

PHASE	Study	Contract No	SCP-CS-054	Phase Status	Active

Phase Title: Hydraulic Surge Control for North Service Center Pumping Station

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

PHASE	Construction	Contract No		Phase Status	Future Planned Start

Phase Title: Hydraulic Surge Control for North Service Center Pumping Station

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
		136	1,172	1,172		

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
23	189	608	1,172	1,172	0	0

Phase Tasks and Dates

Phase Category: C
Budget: Water
Phase Status: Future Planned Start
Contract No:
Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Procurement	1/15/2020	167	6/30/2020
Project Execution	7/1/2020	727	6/28/2022
Project Closeout	6/29/2022	83	9/20/2022

Phase Category: D/CA
Budget: Water
Phase Status: Future Planned Start
Contract No: NA
Cost Est Class:

Design & Construction Assistance

Task Name	Start Date	Duration	End Date
Procurement	1/15/2020	167	6/30/2020
Project Execution	7/1/2020	727	6/28/2022
Project Closeout	6/29/2022	83	9/20/2022

CIP Number: **132004**

Phase Category	S
Budget	Water
Phase Status	Active
Contract No	SCP-CS-054
Cost Est Class	

Study

Task Name	Start Date	Duration	End Date
Procurement	1/15/2020	167	6/30/2020
Project Execution	7/1/2020	727	6/28/2022
Project Closeout	6/29/2022	83	9/20/2022

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		200	500	2,000	100				0	2,800
2019	0	75	23	189	608	1,172	1,172	0	0	3,239

Description of CIP Changes: Updated cost Allocation

CIP Number: **132005**

Old CIP No.: 1288

Project Title: **Energy Management: Evaluation/Corrective Action**

Project Status Cancelled

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Energy management to reduce energy costs

Project Significance: Energy management improvements necessary to reduce energy cost associated with penalties charge by power providers during varying demand scenarios. Improvements include electrical improvements likely in the form of power factor correction capacitors.

Project Engineer/Manager: Shaker Manns

Manager: Shaker Manns

Scope of Work: The scope of work for this project is to evaluate the available alternatives to correct the power factor at the selected booster pumping stations and recommend the most cost effective and reliable solution to increase the power factors above 85%.

Challenges: Impact on electrical system design required and coordination with pump station needs assessment required.

CIP Number: **132005**

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			125	125					0	250

Description of CIP Changes

CIP Number: **132006**

Old CIP No.: 1293

Project Title: **Ford Road PS - Pressure and Control Improvements**

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Review Committee Project Score: **43.4**

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Ford Road Booster Pumping Station

Project Significance: Design of pressure and flow control equipment for efficient delivery of consistent pressures to wholesale customers at Ford Road water booster pumping station

Project Engineer/Manager: Timothy Kuhns

Manager: Grant Gartrell

Scope of Work: The work involves designing variable speed pumping equipment and controls on line and reservoir pumping units to better match water demands to efficiently provide consistent pressures and flows to wholesale customers in the service area.

Challenges: N/A - Under Procurement

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No CS-1749 Phase Status Active

Phase Title Pressure and Control Improvements at the Electric, Ford Road, Michigan, and West Chicago Water Booster Pumping Stations

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
245	182	0	0	0	0	0

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title Pressure and Control Improvements at the Electric, Ford Road, Michigan, and West Chicago Water Booster Pumping Stations

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	42	1,212	1,212	0	0	0

CIP Number: **132006**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
245	224	1,212	1,212	0	0	0

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement	9/6/2018	181	3/6/2019
Project Execution	3/7/2019	503	7/22/2020
Project Closeout	7/23/2020	83	10/14/2020

Phase Category	S/D/CA
Budget	Water
Phase Status	Active
Contract No	CS-1749
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement	9/6/2018	181	3/6/2019
Project Execution	3/7/2019	503	7/22/2020
Project Closeout	7/23/2020	83	10/14/2020

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			200	2,800					0	3,000
2019	0	8	245	224	1,212	1,212	0	0	0	2,901

Description of CIP Changes: Updated prioritization scores and project expenses.

CIP Number: 132007

Old CIP No.: 1294

Project Title: Imlay PS - Energy Management: Freeze Protection Pump Installation

Project Status Future Planned

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Review Committee Project Score: 37.6

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Imlay Pump Station

Project Significance: Project driven by eliminating the application of using existing large pumping units to recirculate and maintain water quality in the existing reservoir during low demand season. Project reduces operating costs, maintains water quality and reduces operating costs, maintains water quality and reduce operating complexity.

Project Engineer/Manager: Eric Kramp

Manager: Grant Gartrell

Scope of Work: The purpose of this project is to minimize the electrical peak demand power charges associated with cycling water in the reservoir during low-demand periods. Rather than running a 6,000 HP motor-driven pump for a few minutes daily, a 150 HP motor-driven pump can run for a few hours to do the same work much less expensively.

Challenges: None.

Phase Expenses

PHASE **Design and Build** | Contract No NA | Phase Status Future Planned Start

Phase Title Energy Management: Freeze Protection Pump Installation at Imlay Pumping Station

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
30	196	472	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
30	196	472	0	0	0	0

CIP Number: **132007**

Phase Tasks and Dates

Phase Category	DB
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development	2/5/2018	25	3/2/2018
Procurement	3/5/2018	361	3/1/2019
Project Execution	3/4/2019	501	7/17/2020
Project Closeout	7/20/2020	81	10/9/2020

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			200	500	300				0	1,000
2019	0		30	196	472	0	0	0	0	698

Description of CIP Changes: Updated project expenses. Moved schedule out one year as this project depends on Flint Genesee County outcome and findings from CS-165 (96" main relocation) study.

CIP Number: 132008

Old CIP No.: 1296

Project Title: Various PS's - Needs Assessment Study

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Review Committee Project Score: 51.2

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Example of a large pipe and valve installation

Project Significance: The work includes a comprehensive needs assessment and hydraulic modeling to determine future station capacities for the nineteen (19) water booster pumping station facilities. Study will include assessment of existing condition and providing list of improvements, upgradign the following items: Facility HVAC and Lighting, Pumping System, Electrical Switch Gear, Instrumentation, Control and Ovation, Fire Protection and Alarms, etc.

Project Engineer/Manager: Erich Klun

Manager: Grant Gartrell

Scope of Work: This project includes a comprehensive condition and needs assessment study of all water booster stations, exclusive of reservoirs. System wide modelling will confirm station decommissioning as recommended by the 2015 Water Master Plan Update. The condition assessments will include all engineering disciplines, with a focus on variable speed pumping applications to meet changing station demands, DTE rate incentive identification, station metering, valve and yard piping improvements and station bypasses.

Challenges: Shutdown, operation and manpower required to cover the condition assessment inspections to complete the work.

Phase Expenses

PHASE **Study** | Contract No SCP-CS-052 | Phase Status Active

Phase Title Needs Assessment Study for all Water Booster Pumping Stations

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	600	1,400	0	0	0	0	0

CIP Number: **132008**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
600	1,400	0	0	0	0	0

Phase Tasks and Dates

Phase Category	S
Budget	Water
Phase Status	Active
Contract No	SCP-CS-052
Cost Est Class	

Study

Task Name	Start Date	Duration	End Date
Scope Development	3/1/2017	120	6/29/2017
Procurement	6/29/2017	33	8/1/2017
Project Execution	8/1/2017	365	8/1/2018
Project Closeout	8/1/2018	90	10/30/2018

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		500	1,200						0	1,700
2019	0	33	600	1,400	0	0	0	0	0	2,033

Description of CIP Changes: Updated project expenses.

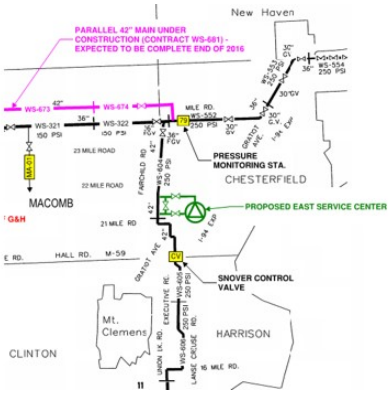
CIP Number: 132009

Old CIP No.: 1334

Project Title: Study Phase for East Service Center Pump

Project Status	Closed	☐	Innovation
Budget:	Water	☐	MP Right Sizin
Classification Lvl 1:	Water	☐	System Reliability
Classification Lvl 2:	SCC		
Classification Lvl 3:	Pump Station/Reservoir		

Review Committee Project Score:



Schematic of proposed East Service Center location

Project Significance: Demands from the Rochester Pump Station may exceed the station's firm capacity. A study is needed to evaluate if a new pump station and reservoir is needed at the existing Snover control valve.

Project Engineer/Manager: Timothy Kuhns

Manager: Grant Gartrell

Scope of Work: This study will provide an evaluation of alternatives to improve redundancy and capacity within the 24-Mile Road branch of the transmission system.

Challenges: Coordination with the pumping station needs assessment and repurposing of Northeast WTP.

Phase Expenses

PHASE **Study** | Contract No | Phase Status Closed Out

Phase Title Study Phase for East Service Center Pump

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond

CIP Number: **132009**

Phase Tasks and Dates

Phase Category	S	**Study**
Budget	Water	
Phase Status	Closed Out	
Contract No		
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		400	100						0	500
2019	0	10								10

Description of CIP Changes

CIP Number: **132010**

Old CIP No.: 1336

Project Title: **West Service Center PS - Duval Rd Division Valve Upgrades**

Project Status Future Planned

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Review Committee Project Score: **54**

Project Significance: PROJECT RECLASSIFID INTO 114009. Construction of West Service Center Division Valves is needed to convey Lake Huron flows through the West Service Center to the Springwells high service area while the Springwells raw water tunnel is out of service for repairs. Construction of active bypass around the Newburgh Pump Station.

Project Engineer/Manager: Timothy Kuhns

Manager: Grant Gartrell

Scope of Work: Lake Huron WTP needs to provide flows to the Springwells high service area while the Springwells raw water tunnel is out of service for repair.

Challenges: Coordination with operations critical meet testing of existing valves. Isolation, shutdown and operation of Lake Huron and Springwells WTPs, North Service Center, and other facilities.

Phase Expenses

PHASE **Design and Construction** Contract No NA Phase Status Future Planned Start

Phase Title West Service Center/Duval Rd Division Valve Upgrades

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	47	2,072	11,072	11,072	11,072	2,036	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
47	2,072	11,072	11,072	11,072	2,036	0

CIP Number: **132010**

Phase Tasks and Dates

Phase Category	D/C
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Design and Construction

Task Name	Start Date	Duration	End Date
Scope Development	1/3/2018	55	2/27/2018
Procurement	2/28/2018	295	12/20/2018
Project Execution	6/4/2019	1455	5/29/2023
Project Closeout	5/30/2023	83	8/21/2023

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			4,200	7,600					0	11,800
2019	0		47	2,072	11,072	11,072	11,072	2,036	0	37,371

Description of CIP Changes: Updated project expenses and phase tasks and dates

CIP Number: 132011

Old CIP No.: 1347

Project Title: West Service Center - Energy Management: VFD Installation

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Variable Frequency Drive (VFD) example

Project Significance: Install Variable Frequency Drives at West Service Center Pump Station to reduce electrical costs

Project Engineer/Manager: Mini Panicker

Manager: Biren Saparia

Scope of Work: To match the non-peak demands the valves are throttled at the station, resulting in loss of energy. This project will install Variable Frequency Drives (VFD) on 700 Hp and 1250 Hp constant speed pumps. VFDs provide better flow and pressure control while providing significant energy savings.

Challenges: May require shut down of large transmission mains.

Phase Expenses

PHASE **Study** Contract No NA Phase Status Cancelled

Phase Title Energy Management: West Service Center (WSC) VFD Installation

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	0	0	0	0	0	0

CIP Number: **132011**

PHASE	**Design**	Contract No	NA	Phase Status	Future Planned Start

Phase Title: Energy Management: West Service Center (WSC) VFD Installation

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

PHASE	**Construction**	Contract No	NA	Phase Status	Future Planned Start

Phase Title: Energy Management: West Service Center (WSC) VFD Installation

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
1,667	1,667	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
1,667	1,667	0	0	0	0	0

Phase Tasks and Dates

Phase Category: C
Budget: Water
Phase Status: Future Planned Start
Contract No: NA
Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	7/3/2017	753	7/26/2019
Project Closeout			

Phase Category: D
Budget: Water
Phase Status: Future Planned Start
Contract No: NA
Cost Est Class:

Design

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	7/3/2017	753	7/26/2019
Project Closeout			

CIP Number: **132011**

Phase Category	S
Budget	Water
Phase Status	Cancelled
Contract No	NA
Cost Est Class	

Study

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	7/3/2017	753	7/26/2019
Project Closeout			

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			1,667	1,667					0	3,334
2019	0		1,667	1,667	0	0	0	0	0	3,334

Description of CIP Changes: Please close this one out. Pump Station Needs Assessment Project will identify if there is a need for this project.

CIP Number: 132012

Old CIP No.:

Project Title: Ypsilanti PS Improvements

Project Status New

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: SCC

Classification Lvl 3: Pump Station/Reservoir

Review Committee Project Score: 61.2

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Ypsilanti Pump Station

Project Significance: Ypsilanti does not have a generator and needs one in the event of a power outage in order to help maintain pressures. The pumps, motors and electrical system are original to the facility and are past their useful service life. The electrical system requires substantial maintenance to keep it in service. Replacement of the motors and electrical system will improve the reliability of the station. In addition, the station does not have a sewer discharge, which is required in order to enable any underground construction due to dewatering discharges.

Project Engineer/Manager: Eric Kramp

Manager: Grant Gartrell

Scope of Work: Replace pumps, motors, drive, switchgear with new. Install a new discharge sewer, backup generator and bypass for the station.

Challenges: Contaminated groundwater at the site. No existing sanitary, storm or combined sewer at the site. A NPDES permit will be required to discharge treated groundwater to a surface water of the state for all construction dewatering operations.

Phase Expenses

PHASE **Construction** Contract No Phase Status New

Phase Title Ypsilanti PS Improvements

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
			2,058	1,972	1,972	1,972	1,936

CIP Number: **132012**

PHASE	Study and Design and Construction Assistance	Contract No		Phase Status	New
Phase Title	Ypsilanti PS Improvements				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
160	332	186				

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
160	332	2,244	1,972	1,972	1,972	1,936

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	New
Contract No	
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Procurement	9/14/2020	179	3/12/2021
Project Execution	3/15/2021	893	8/25/2023
Project Closeout	8/28/2023	81	11/17/2023

Phase Category	S/D/CA
Budget	Water
Phase Status	New
Contract No	
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Procurement	9/14/2020	179	3/12/2021
Project Execution	3/15/2021	893	8/25/2023
Project Closeout	8/28/2023	81	11/17/2023

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2019	0		160	332	2,244	1,972	1,972	1,972	1,936	10,588

Description of CIP Changes

CIP Number: 161001

Old CIP No.: 1233

Project Title: Water Master Plan Update

Project Status Pending Closeout

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: General Purpose

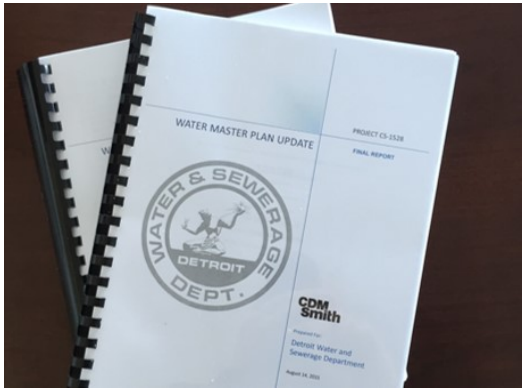
Classification Lvl 3: General Purpose

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability



Previous Water Master Plan

Project Significance: Road map to maintain and improve the overall system performance on a cost-efficient basis

Project Engineer/Manager: Grant Gartrell

Manager: Grant Gartrell

Scope of Work: This project consists of the update of the 2004 Water Master Plan including a review of current and ongoing studies, regulatory mandates under the Clean Water Act and State of Michigan, contractual obligations to the customers and Department policies.

Challenges: N/A - Active

Phase Expenses

PHASE **Study** Contract No Phase Status Pending Close-out

Phase Title Water Master Plan Update

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond

CIP Number: **161001**

Phase Tasks and Dates

Phase Category	S	**Study**
Budget	Water	
Phase Status	Pending Close-out	
Contract No		
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		290							0	290
2019	222	108								330

Description of CIP Changes

CIP Number: 170100

Old CIP No.: 1256

Project Title: Water Treatment Plant /Pump Station Allowance

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Programs

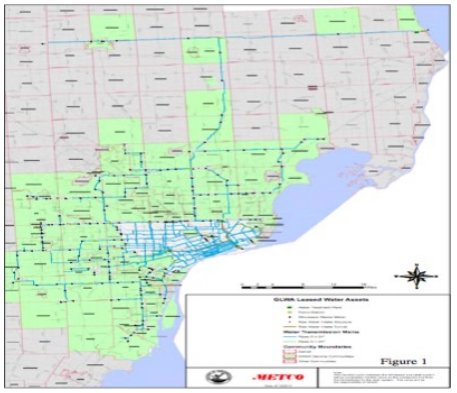
Classification Lvl 3: Programs

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Review Committee Project Score: 64.4



GLWA Water Service Area

Project Significance: This allowance is reserved for unplanned, emergency and critical project needs that need to be addressed quickly.

Project Engineer/Manager: Grant Gartrell

Manager: Grant Gartrell

Scope of Work: This project is an allowance for unplanned, critical projects that may occur at the Water Treatment Plants and Booster Pump Stations throughout the system. These projects may include repair, replacement or rehabilitation of key assets as required to allow the Authority to provide sufficient water quality, quantity and pressure to meet customer demands in accordance with federal and state requirements under the Safe Drinking Water Act.

Challenges: Close coordination with operations and ability to jump on needs.

Phase Expenses

PHASE **Construction** Contract No CON-153 Phase Status Active

Phase Title CON-153: Water Works Park WTP Raw Water Sampling Improvements

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	430						

CIP Number: **170100**

PHASE	**Construction**	Contract No	SCP-SP-009	Phase Status	Closed Out
Phase Title	SP-009: Weiss: 1958 Sedimentation Basin				

Phase Total

PHASE	**Design Build Assistance**	Contract No	SCP-CS-1692	Phase Status	Active
Phase Title	SCP-CS-1692: OHM Advisors: Phosphoric Acid				

Phase Total

PHASE	**Construction**	Contract No	SCP-NE-017	Phase Status	Active
Phase Title	SCP-NE-017: Weiss Construction: Phosphor				

Phase Total

PHASE	**Construction**	Contract No	LH-398	Phase Status	Pending Close-out
Phase Title	SCP-LH-398: Phosphoric Acid Tank Fill Lines				

Phase Total

PHASE	**Design & Construction Assistance**	Contract No	SCP-CS-1656	Phase Status	Active
Phase Title	CS-1656: Applied Science: Flow Measurement				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
3,872	3,872					

PHASE	**Design and Construction**	Contract No	NA	Phase Status	Future Planned Start
Phase Title	Unallocated Water Treatment Plant /Pump Station Allowance				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
4,990	5,306	10,000	10,000	10,000	10,000	0

CIP Number: **170100**

PHASE	**Design & Construction Assistance**	Contract No	CS-1738	Phase Status	Active
Phase Title	CS-1738: Alfred Benesch: Orion & Newberg				

Phase Total

PHASE	**Construction**	Contract No	SCP-DWS-059	Phase Status	Active
Phase Title	SCP-DWS-059: CA Hull: Intake Lagoon				

Phase Total

PHASE	**Construction**	Contract No	SCP-NE-007	Phase Status	Active
Phase Title	SCP-NE-007: DeCal: Instrument Air Compressor				

Phase Total

PHASE	**Construction**	Contract No	DWS-063	Phase Status	Active
Phase Title	Adams Road Water Isolation Gate				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
270	822					

PHASE	**Design**	Contract No	CS-1630	Phase Status	Closed Out
Phase Title	CS-1630: Black & Veatch: Master Specs				

Phase Total

PHASE	**Study**	Contract No	CS-187	Phase Status	Active
Phase Title	GLWA-CS-187: FK Eng: Raw Water Intake				

Phase Total

CIP Number: **170100**

PHASE	Design	Contract No	CS-1674	Phase Status	Closed Out

Phase Title: CS-1674: Testing Engineers: Roof Inspect

Phase Total

PHASE	Construction	Contract No	SCP-CON-094	Phase Status	Active

Phase Title: SCP-CON-094: Z Contr: Belle Isle Water Station

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
438						

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
10,000	10,000	10,000	10,000	10,000	10,000	0

Phase Tasks and Dates

Phase Category: C
Budget: Water
Phase Status: Active
Contract No: SCP-CON-094
Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Project Execution	10/2/2017	242	6/1/2018
Project Closeout	6/4/2018	81	8/24/2018

Phase Category: C
Budget: Water
Phase Status: Active
Contract No: DWS-063
Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Project Execution	10/2/2017	242	6/1/2018
Project Closeout	6/4/2018	81	8/24/2018

CIP Number: **170100**

Phase Category	C
Budget	Water
Phase Status	Active
Contract No	SCP-NE-007
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Project Execution	10/2/2017	242	6/1/2018
Project Closeout	6/4/2018	81	8/24/2018

Phase Category	C
Budget	Water
Phase Status	Active
Contract No	SCP-DWS-059
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Project Execution	10/2/2017	242	6/1/2018
Project Closeout	6/4/2018	81	8/24/2018

Phase Category	C
Budget	Water
Phase Status	Pending Close-out
Contract No	LH-398
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Project Execution	10/2/2017	242	6/1/2018
Project Closeout	6/4/2018	81	8/24/2018

Phase Category	C
Budget	Water
Phase Status	Active
Contract No	SCP-NE-017
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Project Execution	10/2/2017	242	6/1/2018
Project Closeout	6/4/2018	81	8/24/2018

CIP Number: **170100**

Phase Category	C
Budget	Water
Phase Status	Closed Out
Contract No	SCP-SP-009
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Project Execution	10/2/2017	242	6/1/2018
Project Closeout	6/4/2018	81	8/24/2018

Phase Category	C
Budget	Water
Phase Status	Active
Contract No	CON-153
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Project Execution	10/2/2017	242	6/1/2018
Project Closeout	6/4/2018	81	8/24/2018

Phase Category	D
Budget	Water
Phase Status	Closed Out
Contract No	CS-1674
Cost Est Class	

Design

Task Name	Start Date	Duration	End Date
Project Execution	10/2/2017	242	6/1/2018
Project Closeout	6/4/2018	81	8/24/2018

Phase Category	D
Budget	Water
Phase Status	Closed Out
Contract No	CS-1630
Cost Est Class	

Design

Task Name	Start Date	Duration	End Date
Project Execution	10/2/2017	242	6/1/2018
Project Closeout	6/4/2018	81	8/24/2018

CIP Number: **170100**

Phase Category	D/C
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Design and Construction

Task Name	Start Date	Duration	End Date
Project Execution	10/2/2017	242	6/1/2018
Project Closeout	6/4/2018	81	8/24/2018

Phase Category	D/CA
Budget	Water
Phase Status	Active
Contract No	CS-1738
Cost Est Class	

Design & Construction Assistance

Task Name	Start Date	Duration	End Date
Project Execution	10/2/2017	242	6/1/2018
Project Closeout	6/4/2018	81	8/24/2018

Phase Category	D/CA
Budget	Water
Phase Status	Active
Contract No	SCP-CS-1656
Cost Est Class	

Design & Construction Assistance

Task Name	Start Date	Duration	End Date
Project Execution	10/2/2017	242	6/1/2018
Project Closeout	6/4/2018	81	8/24/2018

Phase Category	S
Budget	Water
Phase Status	Active
Contract No	CS-187
Cost Est Class	

Study

Task Name	Start Date	Duration	End Date
Project Execution	10/2/2017	242	6/1/2018
Project Closeout	6/4/2018	81	8/24/2018

CIP Number: **170100**

Phase Category	DBA
Budget	Water
Phase Status	Active
Contract No	SCP-CS-1692
Cost Est Class	

Design Build Assistance

Task Name	Start Date	Duration	End Date
Project Execution	10/2/2017	242	6/1/2018
Project Closeout	6/4/2018	81	8/24/2018

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		12,645	19,650	20,000	20,000	10,000	10,000		0	92,295
2019	3,009	3,768	10,000	10,000	10,000	10,000	10,000	10,000	0	66,777

Description of CIP Changes: Updated project expenses. Continued $20M into out years FY21 & FY22. (Formerly $10M per year)

CIP Number: **170200**

Old CIP No.: 1291

Project Title: **As Needed Construction Materials, Environmental Media and Special Testing Services, Construction Inspection, and Other Technical Services**

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Review Committee Project Score: **20**

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Example of concrete testing

Project Significance: Provides readily accessible, qualified testing and inspection services for unforeseen and minor projects

Project Engineer/Manager: Eric Kramp

Manager: Grant Gartrell

Scope of Work: This engineering/technical services contract involves as-needed engineering and technical services related to geotechnical investigations and related geotechnical engineering, construction materials sampling and testing, environmental media sampling and testing, soils sampling and testing, land surveying, corrosion testing and inspection, computer-aided design, and construction inspection.

Challenges: N/A - Under Procurement

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No CS-1726 Phase Status Under Procurement

Phase Title As Needed Construction Materials, Environmental Media and Special Testing Services, Construction Inspection, and Other Technical Service

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	172	472	572	572	0	0	0

CIP Number: **170200**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
172	472	572	572	0	0	0

Phase Tasks and Dates

Phase Category	S/D/CA
Budget	Water
Phase Status	Under Procurement
Contract No	CS-1726
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	6/1/2017	120	9/29/2017
Procurement	9/29/2017	120	1/27/2018
Project Execution	1/27/2018	1460	1/26/2022
Project Closeout	1/26/2022	90	4/26/2022

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			500	500	500				0	1,500
2019	0		172	472	572	572	0	0	0	1,788

Description of CIP Changes: Updated prioritization and expenses.

CIP Number: 170300

Old CIP No.: 1401

Project Title: Water Treatment Plant Automation Program

Project Status	Active
Budget:	Water
Classification Lvl 1:	Water
Classification Lvl 2:	Programs
Classification Lvl 3:	Programs
Review Committee Project Score:	

☐ Innovation
☐ MP Right Sizin
☐ System Reliability

Project Significance: The automation design and construction project comes from recommendations that identified existing station process data conditions, station needs, GLWA mission critical assets, alternative improvement options to address identified needs, recommended improvements to address the needs, prioritized projects based on the GLWA CIP scoring tool, and scheduling for making the improvements along with associated capital improvement budgets associated with each project established under CS-108.

Project Engineer/Manager: Jeffrey Dorsey

Manager: Grant Gartrell

Scope of Work: The purpose of this project is to implement the recommendations from CS-108 that are prioritized in five (5) year increments with an estimated cost of $1 million dollars per year over a twenty (20) year span.

Challenges: Standardization of multiple different data process equipment already installed throughout the 5 plants could be a problem.

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title Unallocated Water Treatment Plant Automation Program

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
		1,340	1,340	1,340	1,340	1,340	

CIP Number: **170300**

PHASE	**Design**	Contract No	NA	Phase Status	Future Planned Start
Phase Title	Water Treatment Plant Automation Program				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	160	160	160	160	160	

PHASE	**Design**	Contract No	CS-108	Phase Status	Pending Close-out
Phase Title	CS-108, Arcadis, WTP Automation				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
1,610						

PHASE	**Design and Construction**	Contract No	SCP-CS-1656	Phase Status	Active
Phase Title	Water Production Plant Flow Metering				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
1,610	1,500	1,500	1,500	1,500	1,500	

Phase Tasks and Dates

Phase Category	C	**Construction**
Budget	Water	
Phase Status	Future Planned Start	
Contract No	NA	
Cost Est Class		

CIP Number: **170300**

Phase Category	D	**Design**
Budget	Water	
Phase Status	Pending Close-out	
Contract No	CS-108	
Cost Est Class		

Phase Category	D	**Design**
Budget	Water	
Phase Status	Future Planned Start	
Contract No	NA	
Cost Est Class		

Phase Category	D/C	**Design and Construction**
Budget	Water	
Phase Status	Active	
Contract No	SCP-CS-1656	
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			1,500	1,500	1,500	1,500	1,500		0	7,500
2019	0	13	1,610	1,500	1,500	1,500	1,500	1,500		9,123

Description of CIP Changes: CS-108 Being used in 2018 to perform the needs assessment related to WTP automation.

CIP Number: 170400

Old CIP No.: 1230

Project Title: Water Transmission Improvement Program

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☑ System Reliability

Example of a failed water main

Project Significance: Assessing, rehabilitating or replacing aging transmission mains in the water system

Project Engineer/Manager: Todd King

Manager: Todd King

Scope of Work: This project is a yearly funding allocation for the design and/or construction work for the rehabilitation or replacement/construction of aging water transmission lines and all appurtenances, connections and related structures.

Challenges: May require shut down of large pumps, isolation or shutdown of large mains etc.

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title Unallocated Water Transmission Improvement Program

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	9,045	9,045	9,045	9,045	9,045	0

PHASE **Design** Contract No NA Phase Status Future Planned Start

Phase Title Water Transmission Improvement Program

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	955	955	955	955	955	0

CIP Number: **170400**

PHASE	Construction	Contract No	SCP-DWS-018	Phase Status	Active

Phase Title: SCP-DWS-018: Z Contract: Ypsilanti Pumping Station By-Pass Valve

Phase Total

PHASE	Construction	Contract No		Phase Status	Pending Close-out

Phase Title: Internal Inspection of GLWA 84" Transmission Main in Troy

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
40						

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
40	10,000	10,000	10,000	10,000	10,000	0

Phase Tasks and Dates

Phase Category	C
Budget	Water
Phase Status	Pending Close-out
Contract No	
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	11/13/2016	2	11/15/2016
Procurement	11/16/2016	5	11/21/2016
Project Execution	11/22/2016	281	8/30/2017
Project Closeout	9/1/2017	29	9/30/2017

Phase Category	C
Budget	Water
Phase Status	Active
Contract No	SCP-DWS-018
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	11/13/2016	2	11/15/2016
Procurement	11/16/2016	5	11/21/2016
Project Execution	11/22/2016	281	8/30/2017
Project Closeout	9/1/2017	29	9/30/2017

CIP Number: **170400**

Phase Category	C
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	11/13/2016	2	11/15/2016
Procurement	11/16/2016	5	11/21/2016
Project Execution	11/22/2016	281	8/30/2017
Project Closeout	9/1/2017	29	9/30/2017

Phase Category	D
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Design

Task Name	Start Date	Duration	End Date
Scope Development	11/13/2016	2	11/15/2016
Procurement	11/16/2016	5	11/21/2016
Project Execution	11/22/2016	281	8/30/2017
Project Closeout	9/1/2017	29	9/30/2017

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			10,000	10,000	10,000	10,000	10,000		0	50,000
2019	120	955	40	10,000	10,000	10,000	10,000	10,000	0	51,115

Description of CIP Changes: Please change PM to Mr. Todd King/Grant Gartrell. Changes to program to include GLWA labor costs.

CIP Number: 170500

Old CIP No.: 1356

Project Title: Transmission System Valve Assessment and Rehabilitation/Replacement

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Review Committee Project Score: 66.8

☐ Innovation

☐ MP Right Sizin

☑ System Reliability

A large valve for a transmission pipe

Project Significance: Replacement/Rehabilitation of GLWA Transmission System Gate Valves will aid in implementing a regular valve exercising program as recommended by AWWA as well as increase the reliability of the transmission system.

Project Engineer/Manager: Todd King

Manager: Todd King

Scope of Work: Evaluate the existing conditions, provide the necessary replacement/ rehabilitation option, design and implement them.

Challenges: May require shutdown of large transmission mains.

Phase Expenses

PHASE **Design and Build** Contract No CON-181 Phase Status Active

Phase Title Transmission System Valve Replacement/Rehabilitation (CON-181)

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	5,000	5,000					

CIP Number: **170500**

PHASE	Design and Build	Contract No	NA	Phase Status	Active

Phase Title: Unallocated Transmission System Valve Assessment and Rehabilitation/Replacement

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	3,036	2,186	4,872	4,872	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
5,000	5,000	3,036	2,186	4,872	4,872	0

Phase Tasks and Dates

Phase Category	DB
Budget	Water
Phase Status	Active
Contract No	NA
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development	7/1/2018	30	7/31/2018
Procurement	7/31/2018	91	10/30/2018
Project Execution	10/30/2018	1000	7/26/2021
Project Closeout	7/31/2021	90	10/29/2021

Phase Category	DB
Budget	Water
Phase Status	Active
Contract No	CON-181
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development	7/1/2018	30	7/31/2018
Procurement	7/31/2018	91	10/30/2018
Project Execution	10/30/2018	1000	7/26/2021
Project Closeout	7/31/2021	90	10/29/2021

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			2,930	3,100	3,100	3,100	3,100		0	15,330
2019	0		5,000	5,000	3,036	2,186	4,872	4,872	0	24,966

Description of CIP Changes: CON-181 Contractor is selected and is soon to start. Financial group moved funds from the future years to FY2018 and FY2019

CIP Number: **170600**

Old CIP No.: 1400

Project Title: **Water Transmission Main Asset Assessment Program**

Project Status	Future Planned	☑	Innovation
Budget:	Water	☐	MP Right Sizin
Classification Lvl 1:	Water	☐	System Reliability
Classification Lvl 2:	Programs		
Classification Lvl 3:	Programs		
Review Committee Project Score:			

Project Significance: Many of the water mains serving the GLWA service area were installed in the early part of the 20th century or the later part of the 19th century, and are now reaching the end of their useful life span. Condition assessment is a process that helps to establish a record of the state of water pipelines. It's essential for cost-efficient repair and replacement programs which in turn will increase the reliability and performance of the system.

Project Engineer/Manager: Todd King

Manager: Todd King

Scope of Work: Evaluate the existing conditions of the transmission system, provide the necessary recommendation for replacement/ rehabilitation.

Challenges: Gaining access to inspect buried pipes is difficult, disruptive and costly. However, there are ways to monitor and test the condition of the piping and methods of performing condition assessment

Phase Expenses

PHASE **Study** Contract No NA Phase Status Future Planned Start

Phase Title Unallocated Water Transmission Main Asset Assessment Program

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,000	2,000	2,000	2,000	2,000	2,000	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,000	2,000	2,000	2,000	2,000	2,000	0

CIP Number: **170600**

Phase Tasks and Dates

Phase Category	S
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Study

Task Name	Start Date	Duration	End Date
Scope Development	11/15/2017	30	12/15/2017
Procurement	12/15/2017	90	3/15/2018
Project Execution	3/15/2018	1600	8/1/2022
Project Closeout	8/1/2022	180	1/28/2023

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			2,626	2,000	2,000	2,000	2,000		0	10,626
2019	0		2,000	2,000	2,000	2,000	2,000	2,000	0	12,000

Description of CIP Changes: Extended program expenses to 2023.

CIP Number: **170700**

Old CIP No.: 1170

Project Title: **Reservoirs Inspection, Repair and Rehabilitation Program**

Project Status Pending Closeout

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

A GLWA reservoir

Project Significance: Identifying issues that may have a direct impact on water quality due to interior/exterior structural failure

Project Engineer/Manager: Timothy Kuhns

Manager: Grant Gartrell

Scope of Work: The work provides for all Pumping Stations, study, design, and construction contract documents for rehabilitation and upgrades, and management services related to construction including award of contract, inspection during construction, and furnishing all construction work through provisional allowance for sub agreements.

Challenges: N/A - Pending Closeout

Phase Expenses

PHASE **Project Management** Contract No DWS-874 Phase Status Pending Close-out

Phase Title Unallocated Booster Stations and Reservoirs Inspection, Rehabilitation and Inspection Repair Program

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
3,400	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
3,400	0	0	0	0	0	0

CIP Number: **170700**

Phase Tasks and Dates

Phase Category	PM	**Project Management**
Budget	Water	
Phase Status	Pending Close-out	
Contract No	DWS-874	
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	9,571	2,316	88						0	11,975
2019	11,422	1,492	3,400	0	0	0	0	0	0	16,314

Description of CIP Changes: $3.4M in remaining costs to be paid out during FY18.

CIP Number: **170800**

Old CIP No.: 1325

Project Title: **Reservoir Inspection, Design and Rehabilitation at Imlay Station, Adams Station, Haggerty Station, LH-WTP, SPW-WTP and SW-WTP**

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

GLWA reservoir

Project Significance: Complete the routine inspection, design and rehabilitation of reservoirs to maintain system reliability.

Project Engineer/Manager: Timothy Kuhns

Manager: Grant Gartrell

Scope of Work: Complete the routine inspection, design and rehabilitation of reservoirs to maintain system reliability.

Challenges: Coordination with operations for shutdowns required to complete the inspection and construction work. System demand dependent.

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title 170801 Phase - Reservoir Inspection, Design and Rehabilitation at Imlay Station, Adams Station, Haggerty Station, LH-WTP, SP-WTP and SW

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	88	3,790	3,790	3,790	3,790	3,790

CIP Number: **170800**

PHASE **Study and Design and Construction Assistance** Contract No Phase Status Active

Phase Title 170801 Phase - Reservoir Inspection, Design and Rehabilitation at Imlay Station, Adams Station, Haggerty Station, LH-WTP, SP-WTP and SW

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
54	18	0	0	0	0	0

PHASE **Design** Contract No GLWA-CS-151 Phase Status Active

Phase Title 170801 Phase - Imlay, WCS,LH,SP,SW Reservoir Inspection

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	946					

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
54	1,052	3,790	3,790	3,790	3,790	3,790

Phase Tasks and Dates

Phase Category C

Budget Water

Phase Status Future Planned Start

Contract No NA

Cost Est Class

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement	4/1/2019	179	9/27/2019
Project Execution	9/30/2019	1453	9/22/2023
Project Closeout	9/25/2023	81	12/15/2023

Phase Category D

Budget Water

Phase Status Active

Contract No GLWA-CS-151

Cost Est Class

Design

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement	4/1/2019	179	9/27/2019
Project Execution	9/30/2019	1453	9/22/2023
Project Closeout	9/25/2023	81	12/15/2023

CIP Number: **170800**

Phase Category	S/D/CA
Budget	Water
Phase Status	Active
Contract No	
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement	4/1/2019	179	9/27/2019
Project Execution	9/30/2019	1453	9/22/2023
Project Closeout	9/25/2023	81	12/15/2023

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		50	3,300	2,550	2,550	2,550			0	11,000
2019	0		54	1,052	3,790	3,790	3,790	3,790	3,790	20,056

Description of CIP Changes: Updated prioritization and project expenses.

CIP Number: 170900

Old CIP No.: 1303

Project Title: Suburban Water Meter Pit Rehabilitation and Meter Replacement

Project Status Future Planned

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Review Committee Project Score: 20

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Example of a Water Meter

Project Significance: Improving meter data reliability, ensuring accurate billing, improving customer service and allow high quality analysis of the system

Project Engineer/Manager: Chandan Sood

Manager: Chandan Sood

Scope of Work: The Proposed improvements should include the following; The replacements of meters that have surpassed their life expectancy, and or the current flow rates exceed the mechanical limits of the meter. Installing entrance hatches that allow safer ingress, and egress, and that can be locked for security. Sand blasting and painting of piping and walls. Waterproofing meter vaults to keep the ground water out. Provide a proper floor slope in meter chambers that allow water to settle in puddles. Repairing damage sump pump discharge lines. Repairing any structural deficiencies in the meter chambers, loose concrete, bricks, and ladder rungs. Installing access tunnels for the meter location that require extensive traffic control, or are very dangerous to enter because of the entrance location. Upgrading and repairing damaged electrical fixtures in the meter vaults. Weather proofing the meter control cabinets, chalking, replacing rubber door seals, replacing missing foam insulation, replacing upgrading cabinet heaters, repairing damaged locking mechanisms. Improving, or paving the access roads, and or parking for meter locations that have limited parking or get overgrown with foliage in the summer time.

Challenges: Requires temporary shutdown of the water supply through the meter

Phase Expenses

PHASE	Design and Construction	Contract No	NA	Phase Status	Future Planned Start
Phase Title	Unallocated Suburban Water Meter Pit Rehabilitation and Meter Replacement				

CIP Number: **170900**

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
4,000	4,000	4,000	4,000	4,000	4,000	0

PHASE **Design and Construction** Contract No NA Phase Status Future Planned Start

Phase Title Suburban Water Meter Pit Rehabilitation and Meter Replacement

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
4,000	4,000	4,000	4,000	4,000	4,000	0

Phase Tasks and Dates

Phase Category D/C

Budget Water

Phase Status Future Planned Start

Contract No NA

Cost Est Class

Design and Construction

Task Name	Start Date	Duration	End Date
Scope Development	7/1/2020	90	9/29/2020
Procurement	9/30/2020	90	12/29/2020
Project Execution	1/1/2021	1095	1/1/2024
Project Closeout	1/2/2024	1	1/3/2024

Phase Category D/C

Budget Water

Phase Status Future Planned Start

Contract No NA

Cost Est Class

Design and Construction

Task Name	Start Date	Duration	End Date
Scope Development	7/1/2020	90	9/29/2020
Procurement	9/30/2020	90	12/29/2020
Project Execution	1/1/2021	1095	1/1/2024
Project Closeout	1/2/2024	1	1/3/2024

CIP Number: **170900**

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		500	4,000	4,000	4,000	4,000	4,000		0	20,500
2019	0		4,000	4,000	4,000	4,000	4,000	4,000	0	24,000

Description of CIP Changes	Program was extended into 2023 causing the increase in overall project expense.

SECTION 2 WASTEWATER

CIP Number: **211001**

Old CIP No.: 291

Project Title: **WRRF Rehabilitation of Primary Clarifiers Rectangular Tanks, Drain Lines, Electrical/Mechanical Building and Pipe Gallery**

Project Status Active

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Primary Treatment

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Pipe Gallery

Project Significance: Rehabilitation for meeting NPDES Permit and NEC requirements

Project Engineer/Manager: Nicolas Nicolas

Manager: Philip Kora

Scope of Work: The work to be completed under this project will include installing ventilation and atmospheric control for the pipe gallery; providing new lights and emergency lights, etc.. This work also includes rehabilitation of 12 drain lines from rectangular clarifiers 3-12, circular clarifiers 16 and 16, installation of large manhole with sump pumps to collect drainage and discharge to clarifier, and concrete crack repairs, and rehabilitation work in Electrical/Mechanical Building.

Challenges: N/A - Active

Phase Expenses

PHASE **Construction** Contract No PC-757 Phase Status Active

Phase Title Rehabilitation of Primary Clarifiers Rectangular Tanks, Drain Lines, Electrical/Mechanical Building and Pipe Gallery

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	12,982	23,835	9,336	0	0	0	0

CIP Number: **211001**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
12,982	23,835	9,336	0	0	0	0

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Active
Contract No	PC-757
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	7/18/2016	1217	11/17/2019
Project Closeout	11/18/2019	182	5/18/2020

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		10,848	12,097	20,990	7,968				0	51,903
2019	14	10,229	12,982	23,835	9,336	0	0	0	0	56,396

Description of CIP Changes

CIP Number: **211002**

Old CIP No.: 961

Project Title: **WRRF PS No. 2 Pumping Improvements - Phase 1**

Project Status Active

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Primary Treatment

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Pump Station 2

Project Significance: Correct drifting issues of pumps and meet long term wet weather capacity needs

Project Engineer/Manager: Alfredo Lava

Manager: Ali Khraizat

Scope of Work: This project involves evaluating and recommending alternatives for providing more reliable pumping capacity at Pump Station No. 2 for Pumps Nos. 11 and 14.

Challenges: N/A - Active

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No CS-1444 Phase Status Active

Phase Title Pump Station No. 2 Pumping Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
174	58	0	0	0	0	0

PHASE **Construction** Contract No PC-795 Phase Status Active

Phase Title PC-795, Pump Station No. 2 Pumping Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
506	3,573	0	0	0	0	0

CIP Number: **211002**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
680	3,631	0	0	0	0	0

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Active
Contract No	PC-795
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	10/17/2016	976	6/20/2019
Project Closeout			

Phase Category	S/D/CA
Budget	Wastewater
Phase Status	Active
Contract No	CS-1444
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	10/17/2016	976	6/20/2019
Project Closeout			

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	456	1,157	1,304	616					0	3,533
2019	29	80	680	3,631	0	0	0	0	0	4,420

Description of CIP Changes

Engineering Services contract will be extended to match the construction schedule. The original project called out for the replacement of only 2 of the 8 magnetic flow meters at pump station no. 2 (PC-795). Operations and Maintenance have indicated that the remaining 6 meters have either failed or are failing. Since we have a contractor mobilized for the work pertaining to replacement of 2 of these devices it makes sense to have them replace the remaining while under contract.

CIP Number: **211003**

Old CIP No.: 1141

Project Title: **WRRF Rehabilitation of Primary Clarifiers**

Project Status Active

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Primary Treatment

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Primary Clarifiers

Project Significance: Rehabilitation to maintain NPDES permit capacity and addressing excessive, maintenance induced downtime

Project Engineer/Manager: Beena Chackunkal

Manager: Ali Khraizat

Scope of Work: This project includes rehabilitation of sludge and scum collectors, replacement of sludge conveyance equipment, and sludge cross scum and collectors for the rectangular clarifiers. The scope of work also includes concrete crack repair on floor, wall, and ceiling.

Challenges: N/A - Active

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No CS-1484 Phase Status Active

Phase Title Rehabilitation of Primary Clarifiers

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
272	255	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
272	255	0	0	0	0	0

CIP Number: **211003**

Phase Tasks and Dates

Phase Category	S/D/CA
Budget	Wastewater
Phase Status	Active
Contract No	CS-1484
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	8/11/2010	3254	7/9/2019
Project Closeout	7/9/2019	60	9/7/2019

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	1	220	240	120					0	581
2019	1,702		272	255	0	0	0	0	0	2,229

Description of CIP Changes: Added in house Force Account.

CIP Number: 211004

Old CIP No.: 1189

Project Title: WRRF PS #1 Rack & Grit and MPI Sampling Station 1 Improvements

Project Status Active

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Primary Treatment

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Rack and Grit

Project Significance: Rehabilitate aging rack and grit system for efficient removal of grit to reduce loading on downstream process areas

Project Engineer/Manager: Partho Ghosh

Manager: Philip Kora

Scope of Work: The scope of work includes modifications and improvements of the existing grit and screening handling system at Pump Station 1 and MPI Sampling Station 1.

Challenges: N/A - Active

Phase Expenses

PHASE **Construction** Contract No PC-789 Phase Status Active

Phase Title Pump Station 1 Rack & Grit and MPI Sampling Station 1 Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
5,066	1,871	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
5,066	1,871	0	0	0	0	0

CIP Number: **211004**

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Active
Contract No	PC-789
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	11/18/2013	2142	9/30/2019
Project Closeout	9/30/2019	60	11/29/2019

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	13,887	2,303	2,652	2,652					0	21,494
2019	18,341	2,603	5,066	1,871	0	0	0	0	0	27,881

Description of CIP Changes: 2017-12-06 Adjusted FY18 Total and Construction Schedule per Phil

CIP Number: 211005

Old CIP No.: 1287

Project Title: WRRF PS No. 2 Improvements Phase II

Project Status Active

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Primary Treatment

Review Committee Project Score: 72.8

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Main Raw Sewage Pumps at Pump Station 2

Project Significance: This project will improve the pump reliability of PS-2 to meet the NPDES permit flow capacity requirements.

Project Engineer/Manager: Alfredo Lava

Manager: Ali Khraizat

Scope of Work: The preliminary scope of this project is to provide basis of design (study) report for rehabilitation/rebuilding plan for existing pump and its control and any associated equipment. The study will look into the addition of VFD to the three constant speed pumps. The study will not be limited to increasing the capacity of existing pumps to meet the long-term goal for wet weather capacity. The Scope also include: Provide engineering design for rehabilitation/rebuilding of the pumps, replacement of HVAC System, I&C Improvements (i.e. automation, etc.), structural, architectural and electrical improvement, provide design for any recommendation made by the study report. The services during construction is: provide construction assistance, such as review of shop drawings, response to RFIs, attending progress meetings, verifying and assisting GLWA for any changes requested by the contractor, etc.

Construction will follow after the completion of design.

Challenges: Shutdowns of the pumps to be rehabilitated will require co-ordination with operations and careful planning to meet NPDES permit requirements for the flow capacity during the construction phase.

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No CS-130 Phase Status Active

Phase Title Pump Station No. 2 Improvements Phase II at Wastewater Treatment Plant (WRRF)

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	7	515	114	250	57	286	57

CIP Number: **211005**

PHASE	Construction	Contract No		Phase Status	Future Planned Start
Phase Title	Pump Station No. 2 Improvements Phase II at Wastewater Treatment Plant (WRRF)				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	9,044	9,044	2,261	677

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
7	515	114	9,294	9,101	2,547	734

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Scope Development			
Procurement			
Procurement			
Project Execution			
Project Execution	11/29/2020	1080	11/14/2023
Project Closeout	11/14/2023	90	2/12/2024
Project Closeout			

Phase Category	S/D/CA
Budget	Wastewater
Phase Status	Active
Contract No	CS-130
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development			
Scope Development			
Procurement			
Procurement			
Project Execution			
Project Execution	11/29/2020	1080	11/14/2023
Project Closeout	11/14/2023	90	2/12/2024
Project Closeout			

CIP Number: **211005**

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			600	1,700	4,800	3,700			0	10,800
2019	0		7	515	114	9,294	9,101	2,547	734	22,312

Description of CIP Changes	Previous estimate for pump rehabilitation was too low. PS#2 needs structural improvements too. Therefore, the estimate went up.

CIP Number: 211006

Old CIP No.: 1312

Project Title: WRRF PS No. 1 Improvements

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Primary Treatment

Review Committee Project Score: 75

- [x] Innovation
- [ ] MP Right Sizin
- [ ] System Reliability

Pump Station 1 Interior

Project Significance: Inspection of condition of all pumps at pump station and rehabilitation to increase efficiency and reliability

Project Engineer/Manager: Alfredo Lava

Manager: Ali Khraizat

Scope of Work: The study/design work will identify all major parts including impellers and wear rings to be refurbished for each pump and all related appurtenances. The construction services will provide rehabilitation and/or replacement as determined in the study and design along with the sequencing of pump shutdown throughout the rehabilitation period.
Investigation and evaluation of all the inlet gates, outlet gates and associated actuators, Motor Control Centers (MCCs) and other related equipment, HVAC system, Control System and provide recommendation and design for rehabilitation or replacement are also part of the scope.

Challenges: Maintaining the adequate pumping capacity during construction will be the most significant challenge on this project.

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No NA Phase Status Future Planned Start

Phase Title Rehabilitation of Main Lift Pumps at Pump Station No. 1

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	166	801	2,297	801	572	572	382

CIP Number: **211006**

PHASE	Construction	Contract No		Phase Status	Future Planned Start

Phase Title: Rehabilitation of Main Lift Pumps at Pump Station No. 1

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	2,261	9,044	9,044	677	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
166	801	4,558	9,845	9,616	1,249	382

Phase Tasks and Dates

Phase Category: C
Budget: Wastewater
Phase Status: Future Planned Start
Contract No:
Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	8/2/2020	1080	7/18/2023
Project Closeout	7/18/2023	60	9/16/2023

Phase Category: S/D/CA
Budget: Wastewater
Phase Status: Future Planned Start
Contract No: NA
Cost Est Class:

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	8/2/2020	1080	7/18/2023
Project Closeout	7/18/2023	60	9/16/2023

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			600	5,350	5,125	2,054			0	13,129
2019	0		166	801	4,558	9,845	9,616	1,249	382	26,617

Description of CIP Changes: Additional Scope to rehabilitate Pump Station too. Previous cost was under estimated.

CIP Number: 211007

Old CIP No.: 1314

Project Title: WRRF PS #2 Bar Racks Replacements and Grit Collection System Improvements

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Primary Treatment

Review Committee Project Score: 65.2

- [x] Innovation
- [ ] MP Right Sizin
- [ ] System Reliability

WRRF Pumping Station 2: Bar Racks and Grit Collection System

Project Significance: Replacement of all bar racks and associated equipment for more reliable and efficient operations. Improvements to the grit collection system will prevent the grit affecting the downstream equipment. These improvements will enable WRRF to be in compliance with NPDES permit.

Project Engineer/Manager: Beena Chackunkal

Manager: Ali Khraizat

Scope of Work: The work consists of evaluation, design and construction for the replacement of Bar Racks and Grit Collection System including their associated motors and electrical panels as necessary to meet the long-term wet weather capacity requirements at thePS-2.

Challenges: Maintaining the MDEQ-NPDES required capacity during the construction phase of the project.

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No Phase Status Future Planned Start

Phase Title Replacement of Bar Racks at Pump Station No.2

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	7	400	1,717	400	171	171	57

CIP Number: **211007**

PHASE	Construction	Contract No		Phase Status	Future Planned Start

Phase Title: Replacement of Bar Racks at Pump Station No.2

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	261	2,000	6,783	6,783	1,802

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
7	400	1,978	2,400	6,954	6,954	1,859

Phase Tasks and Dates

Phase Category: C
Budget: Wastewater
Phase Status: Future Planned Start
Contract No:
Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Scope Development	4/1/2020	182	9/30/2020
Procurement	9/30/2020	120	1/28/2021
Project Execution	1/29/2021	1080	1/14/2024
Project Closeout	1/14/2024	60	3/14/2024

Phase Category: S/D/CA
Budget: Wastewater
Phase Status: Future Planned Start
Contract No:
Cost Est Class:

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	4/1/2020	182	9/30/2020
Procurement	9/30/2020	120	1/28/2021
Project Execution	1/29/2021	1080	1/14/2024
Project Closeout	1/14/2024	60	3/14/2024

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			650	2,900	3,300	2,817			0	9,667
2019	0		7	400	1,978	2,400	6,954	6,954	1,859	20,552

Description of CIP Changes: Previous projected expense was under estimated.

CIP Number: 211008

Old CIP No.: 1382

Project Title: WRRF Rehabilitation of Ferric Chloride Feed System in PS-1 and Complex B Sludge Lines

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Primary Treatment

Review Committee Project Score: 74.2

- [x] Innovation
- [ ] MP Right Sizin
- [ ] System Reliability

Ferric Chloride Tanks at Pump Station 1

Project Significance: The Ferric Chloride Systems at PS-1 is used to reduce phosphorus to the required permit levels. The system, which include chemical storage tanks, secondary containment, valves and piping is in need of rehabilitation. The Complex B sludge lines are clogged due to Struvite and need rehabilitation/replacement.

Project Engineer/Manager: Ravi Yelamanchi

Manager: Ali Khraizat

Scope of Work: The scope of work will include study design and construction for the ferric chloride feed system at PS-1. Specifically it will include: a study to evaluate alternative locations for application of ferric chloride, a pilot study to test alternative application points, and inspection of the existing chemical feed systems, a study to provide recommendations for system modifications and improvements, design of recommended system improvements, and construction of chemical feed system improvements. Evaluation and recommended design and construction of the sludge lines in Complex B is also included in the scope.

Challenges: Maintaining capacity of the existing feed system during construction will be a challenge. Also, determining the simplest system that will meet current and future phosphorous limits for both primary and secondary effluent will be a challenge.

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No Phase Status Future Planned Start

Phase Title Rehabilitation of Ferric Chloride Feed Systems

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	7	114	1,259	469	297	102	0

CIP Number: **211008**

PHASE	Construction	Contract No		Phase Status	Future Planned Start

Phase Title: Rehabilitation of Ferric Chloride Feed Systems

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	2,261	5,237	2,261	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
7	114	1,259	2,730	5,534	2,363	0

Phase Tasks and Dates

Phase Category: C

Budget: Wastewater

Phase Status: Future Planned Start

Contract No:

Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Scope Development	3/8/2020	180	9/4/2020
Procurement	9/4/2020	120	1/2/2021
Project Execution	1/3/2021	720	12/24/2022
Project Closeout	12/24/2022	60	2/22/2023

Phase Category: S/D/CA

Budget: Wastewater

Phase Status: Future Planned Start

Contract No:

Cost Est Class:

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	3/8/2020	180	9/4/2020
Procurement	9/4/2020	120	1/2/2021
Project Execution	1/3/2021	720	12/24/2022
Project Closeout	12/24/2022	60	2/22/2023

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			400	1,400	5,200	2,000	633		0	9,633
2019	0		7	114	1,259	2,730	5,534	2,363	0	12,007

Description of CIP Changes: Increase in cost due to changes in overall project estimates.

CIP Number: 211009

Old CIP No.: 1386

Project Title: WRRF Rehabilitation of the Circular Primary Clarifier Scum Removal System

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Primary Treatment

Review Committee Project Score: 70.2

- [x] Innovation
- [ ] MP Right Sizin
- [ ] System Reliability

The existing scum system is complicated to operate and difficult to maintain, equipment remains out of service for extended period. The scum beaches need better enclosure and heating system, during extreme cold conditions scum collection system get frozen

Project Significance: The circular clarifiers scum removal system is over 10 years old and need to be rehabilitated. They will help protect the secondary treatment process by preventing scum from entering the aeration tanks.

Project Engineer/Manager: Ali Khraizat

Manager: Ali Khraizat

Scope of Work: This project will provide for the study, design and construction of new scum equipment in the Scum Buildings for the circular clarifiers . The study will consist of an evaluation of the existing process and simplified alternative systems for scum removal including the scum removal from the buildings. Future alternatives for scum disposal, such as addition to an anaerobic digestion process, will be considered. All alternatives will be evaluated for energy efficiency (reduction of electrical usage). The scum removal system at the rectangular PCs will also be evaluated to determine which aspects can be applied to the circular SBs. Design and construction services will be included for the selected scum removal system.

Challenges: Each of the scum removal facility serves two circular clarifiers, so two circular clarifiers at a given time needs to be out of services during rehabilitation, this will limit the primary capacity to minimum to meet NPDES permit requirements.

Phase Expenses

PHASE	Study and Design and Construction Assistance	Contract No		Phase Status	Future Planned Start
Phase Title	Rehabilitation of the Circular Primary Clarifier Scum Removal System				

CIP Number: **211009**

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	7	858	572	143	143

PHASE **Construction** Contract No Phase Status Future Planned Start

Phase Title Rehabilitation of the Circular Primary Clarifier Scum Removal System

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	5,652	4,860

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	7	858	572	5,795	5,003

Phase Tasks and Dates

Phase Category C

Budget Wastewater

Phase Status Future Planned Start

Contract No

Cost Est Class

Construction

Task Name	Start Date	Duration	End Date
Scope Development	8/7/2021	180	2/3/2022
Procurement	2/3/2022	120	6/3/2022
Project Execution	6/4/2022	720	5/24/2024
Project Closeout	5/24/2024	60	7/23/2024

Phase Category S/D/CA

Budget Wastewater

Phase Status Future Planned Start

Contract No

Cost Est Class

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	8/7/2021	180	2/3/2022
Procurement	2/3/2022	120	6/3/2022
Project Execution	6/4/2022	720	5/24/2024
Project Closeout	5/24/2024	60	7/23/2024

CIP Number: **211009**

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			266	324	1,870	2,671	2,670	2,679	0	10,480
2019	0		0	0	7	858	572	5,795	5,003	12,235

Description of CIP Changes	Difference in estimated cost due to addition of in-house force account expenses.

CIP Number: 212001

Old CIP No.: 1100

Project Title: WRRF Returned Activated Sludge (RAS) Pumps, Influent Mixed Liquor System and Motor Control Centers (MCC) Improvements for Secondary Clarifiers

Project Status Pending Closeout

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Secondary Treatment & Disinfe

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Return activated sludge pump and Motor Control Center building

Project Significance: Replace aging pump units, control and instrumentation and building enclosures

Project Engineer/Manager: Nicolas Nicolas

Manager: Philip Kora

Scope of Work: This project provides new power supply cable to/from secondary clarifiers and substation MCC, provides new MCCs at each secondary clarifier, provides short-circuit analysis and fault rating , replace 25 RAS pumps at the secondary clarifiers and complete all miscellaneous electrical work such as replacement of cables, conduit, pull boxes, panels and junctions boxes, etc.

Challenges: N/A - Active

Phase Expenses

PHASE **Construction** Contract No PC-776 Phase Status Pending Close-out

Phase Title Returned Activated Sludge (RAS) Pumps, Influent Mixed Liquor System and Motor Control Centers (MCC) Improvements for Secondary Clari

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

CIP Number: **212001**

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Pending Close-out
Contract No	PC-776
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	24,060	115							0	24,175
2019	32,630	1,460	0	0	0	0	0	0	0	34,090

Description of CIP Changes: This project was closed out in May 2016.

CIP Number: **212002**

Old CIP No.: 1117

Project Title: **WRRF Study, Design, & Construction Management Services for Modified Detroit River Outfall No. 2**

Project Status Pending Closeout

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Secondary Treatment & Disinfe

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

DRO2 plan at WRRF

Project Significance: Provide remediation and decommissioning of non-utilized portions of as-built PC-709 construction, which resulted in a flooded tunnel

Project Engineer/Manager: Alfredo Lava

Manager: Ali Khraizat

Scope of Work: The scope of work includes limited study, detailed design, preparation of construction plans, and construction management services necessary to implement the modified Detroit River Outfall No. 2 in accordance with NPDES Permit requirements.

Challenges:

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No CS-1448 Phase Status Pending Close-out

Phase Title Study, Design, & Construction Management Services for Modified Detroit River Outfall No. 2 - WRRF

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

CIP Number: **212002**

Phase Tasks and Dates

Phase Category	S/D/CA
Budget	Wastewater
Phase Status	Pending Close-out
Contract No	CS-1448
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	8,449	33							0	8,482
2019	10,370	449	0	0	0	0	0	0	0	10,819

Description of CIP Changes

CIP Number: 212003

Old CIP No.: 1194

Project Title: WRRF Aeration System Improvements

Project Status Active

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Secondary Treatment & Disinfe

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Equipment for aeration system

Project Significance: Improve aeration system and provide necessary inter-connections

Project Engineer/Manager: Kashmira Patel

Manager: Philip Kora

Scope of Work: The scope of work includes study, design, and construction assistance for the oxygen baffle on Bay 10 of A1 & A2 decks, replacement of influent, Return Activated Sludge (RAS) piping, isolation gate and valves for decks Nos. 3 & 4, replace RAS and influent magmeters for Intermediate Lift Pumps (ILP) Nos. 3, 4 & 7. The work also includes replacement of influent gates and operators on Aeration Deck No. 1 & 2.

Challenges: N/A - Under Procurement

Phase Expenses

PHASE **Construction** Contract No PC-796 Phase Status Active

Phase Title Aeration System Improvements

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	11,305	3,626	0	0	0	0	0

CIP Number: **212003**

PHASE	Study and Design and Construction Assistance	Contract No	CS-157	Phase Status	Active

Phase Title: Aeration System Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
186	92	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
11,491	3,718	0	0	0	0	0

Phase Tasks and Dates

Phase Category: C

Budget: Wastewater

Phase Status: Active

Contract No: PC-796

Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	10/3/2016	660	7/25/2018
Project Closeout	7/26/2018	60	9/24/2018

Phase Category: S/D/CA

Budget: Wastewater

Phase Status: Active

Contract No: CS-157

Cost Est Class:

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	10/3/2016	660	7/25/2018
Project Closeout	7/26/2018	60	9/24/2018

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		2,348	11,197	2,658					0	16,203
2019	1,903	1,902	11,491	3,718	0	0	0	0	0	19,014

Description of CIP Changes: CS- 1498 is changed to CS-157.

CIP Number: 212004

Old CIP No.: 1222

Project Title: WRRF Chlorination and Dechlorination Process Equipment Improvements

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Secondary Treatment & Disinfe

Review Committee Project Score: 81.6

- [x] Innovation
- [ ] MP Right Sizin
- [ ] System Reliability

Chlorinator/Sulfonator buildings

Project Significance: The disinfection complex equipment condition has deteriorated because of the corrosive characteristics of the chemicals utilized in the operations of the area. This project is needed to restore equipment performance to OEM levels.

Project Engineer/Manager: Ali Khraizat

Manager: Ali Khraizat

Scope of Work: Scope of Work is to refurbish evaporators, chlorinators/sulfonators, replace regulating check valves, ejectors, process water valves, gas safety panels, compressors, gas flow meters, and all accessories and appurtenances. This proposed CIP budget is for construction only. The design and construction assistance services are budgeted through "As Needed Engineering Services Contract CS-1481, Task #23".

Challenges: Chlorine and sulfur dioxide are both extremely hazardous toxic chemicals that can impact staff and the public if an uncontrolled gas release occurs. Maintaining staff safety, regulatory compliance, and meeting production requirements is a challenge.

Phase Expenses

PHASE **Construction** Contract No Phase Status Future Planned Start

Phase Title Replacement of Chlorination and Dechlorination Equipment at the WRRF

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	1,130	3,391	659	0	0	0	0

CIP Number: **212004**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
1,130	3,391	659	0	0	0	0

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement	11/2/2017	120	3/2/2018
Project Execution	3/3/2018	540	8/25/2019
Project Closeout	8/25/2019	60	10/24/2019

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			400	2,800	1,800				0	5,000
2019	0	86	1,130	3,391	659	0	0	0	0	5,266

Description of CIP Changes

CIP Number: 212005

Old CIP No.: 1235

Project Title: WRRF Rouge River Outfall No. 2 (RRO-2) Segment 1

Project Status Pending Closeout

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Secondary Treatment & Disinfe

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Piece of movable dam at DRO-2

Project Significance: Cap abandoned entrance shaft of failed DRO-2 tunnel and rehabilitate movable dams and stop logs to control wet weather flow discharge

Project Engineer/Manager: Partho Ghosh

Manager: Philip Kora

Scope of Work: The scope of work includes installation of new Stop Log-8 Gates, modification of Movable Dam MD-1, and installation of new power pack building. This project will also provide for a hydraulic actuation system for gates MD-3 A/B and SG 41-44, modification of stop logs SL-1 A/B, and replace chlorination/dechlorination tank car emergency shutoff valves. The project will further include modification of PLC based control system, capping abandoned PC-709 precast tunnel lining segments.

Challenges:

Phase Expenses

PHASE **Construction** Contract No PC-786 Phase Status Pending Close-out

Phase Title Rouge River Outfall No. 2 (RRO-2) Segment 1 - WRRF Modifications

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

CIP Number: **212005**

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Pending Close-out
Contract No	PC-786
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	12,125	62							0	12,187
2019	209	43	0	0	0	0	0	0	0	252

Description of CIP Changes: This contract was closed out in September 2016.

CIP Number: 212006

Old CIP No.: 1302

Project Title: WRRF Rouge River Outfall (RRO) Disinfection (Alternative)

Project Status Active

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

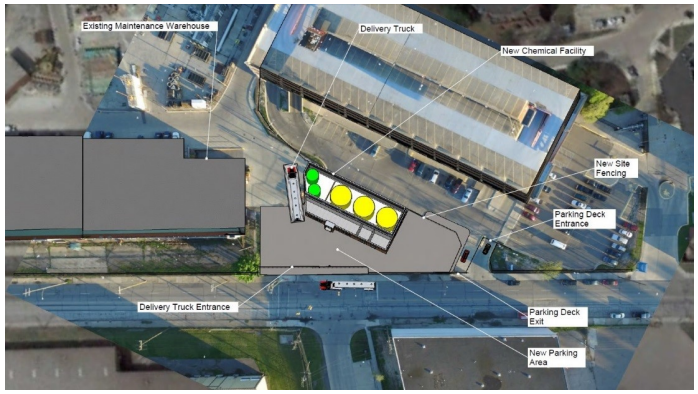
Classification Lvl 3: Secondary Treatment & Disinfe

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability



Plan view of RRO location

Project Significance: Provide project oversight and design build services for alternative disinfection services to meet NPDES Permit requirements at existing Rouge River Outfall

Project Engineer/Manager: Darrel Field

Manager: Philip Kora

Scope of Work: The consultant shall provide comprehensive professional services for project oversight and Owner's representation for the PC-797 RRO Disinfection Progressive Design-Build Contract. The scope of work consists of completing basis of design, design and construction services to develop and implement a solution that will result in 100% disinfection of wet weather flow discharged from WRRF to Detroit River outfall and Rouge River Outfall in order to meet NPDES Permit requirements.

Challenges: N/A - Under Procurement

Phase Expenses

PHASE **Construction Management** Contract No CS-1781 Phase Status Under Procurement

Phase Title Rouge River Outfall (RRO) Disinfection (Alternative)

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	760	639	211	0	0	0	0

CIP Number: **212006**

PHASE	Design and Build	Contract No	PC-797	Phase Status	Under Procurement

Phase Title: Rouge River Outfall (RRO) Disinfection (Alternative)

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
19,958	17,725	1,643	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
20,718	18,364	1,854	0	0	0	0

Phase Tasks and Dates

Phase Category	CM	**Construction Management**
Budget	Wastewater	
Phase Status	Under Procurement	
Contract No	CS-1781	
Cost Est Class		

Phase Category	DB	**Design and Build**
Budget	Wastewater	
Phase Status	Under Procurement	
Contract No	PC-797	
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	729	6,530	15,800	15,520	9,020				0	47,599
2019	912	5,961	20,718	18,364	1,854	0	0	0	0	47,809

Description of CIP Changes: Change Order No.3 has been issued to the Contractor for the phase 2 work (design completion and construction work) for

CIP Number: **212006**

$38,925,000.

CIP Number: 212007

Old CIP No.: 1385

Project Title: WRRF Rehabilitation of the Secondary Clarifiers

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

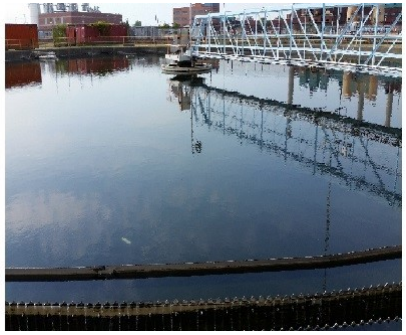
Classification Lvl 3: Secondary Treatment & Disinfe

Review Committee Project Score: 53.2

☐ Innovation

☐ MP Right Sizin

☐ System Reliability



Only one or maximum two out of total 25 secondary clarifiers can be taken out of service at a time for repairs. Secondary system has a lot of moving parts and equipment. A long term (8 years) rehabilitation program for the secondary clarifiers needs to be

Project Significance: The secondary clarifiers need to be inspected and rehabilitated for certain components such as the rake arms.

Project Engineer/Manager: Beena Chackunkal

Manager: Ali Khraizat

Scope of Work: This project will provide for inspection, study, design, and construction for refurbishing the secondary clarifiers. A key component will be the inspection of the concrete and the rake arms. Once the condition of these components is determined, alternatives will be evaluated and the selected alternative will be designed and constructed. The scope will also include evaluating and designing isolation gates for the individual clarifiers. The B Houses have energy intensive HVAC units. These will be evaluated for potential payback with alternative, energy efficient units.

Challenges: This will be a long term project because only one or two clarifiers can be taken out of service at a time. Also, there may be different levels of rehabilitation for each clarifier depending upon the results of the inspection.

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No Phase Status Future Planned Start

Phase Title Rehabilitation of the Secondary Clarifiers

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	0	858	1,374	858	171	458

CIP Number: **212007**

PHASE	Construction	Contract No		Phase Status	Future Planned Start

Phase Title: Rehabilitation of the Secondary Clarifiers

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	2,821	9,044	19,218

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	858	1,374	3,679	9,215	19,676

Phase Tasks and Dates

Phase Category: C
Budget: Wastewater
Phase Status: Future Planned Start
Contract No:
Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Scope Development	6/3/2021	180	11/30/2021
Procurement	11/30/2021	120	3/30/2022
Project Execution	3/31/2022	1080	3/15/2025
Project Closeout	3/15/2025	60	5/14/2025

Phase Category: S/D/CA
Budget: Wastewater
Phase Status: Future Planned Start
Contract No:
Cost Est Class:

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	6/3/2021	180	11/30/2021
Procurement	11/30/2021	120	3/30/2022
Project Execution	3/31/2022	1080	3/15/2025
Project Closeout	3/15/2025	60	5/14/2025

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			301	3,576	5,543	5,540	5,540	10,499	0	30,999
2019	0		0	0	858	1,374	3,679	9,215	19,676	34,802

Description of CIP Changes: Previous estimated cost was under estimated.

CIP Number: 212008

Old CIP No.:

Project Title: WRRF Rehabilitation of Intermediate Lift Pumps (ILPs)

Project Status	New	☑	Innovation
Budget:	Wastewater	☐	MP Right Sizin
Classification Lvl 1:	Wastewater	☐	System Reliability
Classification Lvl 2:	WRRF		
Classification Lvl 3:	Secondary Treatment & Disinfe		

Review Committee Project Score: 72.8

Intermediate Lift Pump Station N.2

Project Significance: The ILPs are old and reached the end of life cycle. Therefore a replacement or rehabilitation will help to comply with the permit capacity requirement for the Secondary Process Area.

Project Engineer/Manager: Beena Chackunkal

Manager: Ali Khraizat

Scope of Work: Investigation, Study including modeling, design and construction of the five intermediate lift pumps that lift primary effluent to the aeration basins for secondary treatment.

Challenges: Maintaining the required wet weather secondary capacity of 930 MGD.

Phase Expenses

PHASE **Construction** Contract No Phase Status New

Phase Title WRRF Rehabilitation of Intermediate Lift Pumps (ILPs)

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
		338	5,652	5,652	5,652	791

PHASE **Study and Design and Construction Assistance** Contract No Phase Status New

Phase Title WRRF Rehabilitation of Intermediate Lift Pumps (ILPs)

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	229	801	916	114	182	182

CIP Number: **212008**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	229	1,139	6,568	5,766	5,834	973

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	New
Contract No	
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	8/5/2020	180	2/1/2021
Procurement	2/1/2021	120	6/1/2021
Project Execution	6/2/2021	1080	5/17/2024
Project Closeout	5/17/2024	60	7/16/2024

Phase Category	S/D/CA
Budget	Wastewater
Phase Status	New
Contract No	
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	8/5/2020	180	2/1/2021
Procurement	2/1/2021	120	6/1/2021
Project Execution	6/2/2021	1080	5/17/2024
Project Closeout	5/17/2024	60	7/16/2024

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2019	0			229	1,139	6,568	5,766	5,834	973	20,509

Description of CIP Changes

CIP Number: 213001

Old CIP No.: 1144

Project Title: WRRF Replacement of Belt Filter Presses for Complex I and Upper Level Complex II

Project Status Pending Closeout

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

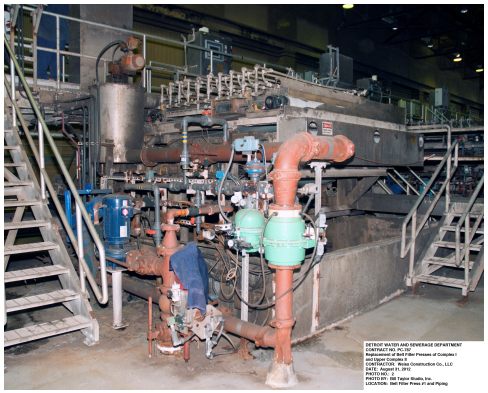
Classification Lvl 3: Residuals Management

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability



PC 787 Belt filter presses replacement

Project Significance: Study, design and construction assistance of equipment experiencing numerous breakdowns and for meeting permit capacities

Project Engineer/Manager: Vinod Sharma / Nicolas Nicolas

Manager: Ali Khraizat

Scope of Work: The work will consist of replacements of 10 Belt Filter Presses for Complex 1 and 12 Belt Filter Presses for Complex II Dewatering, Screened Final Effluent booster pumps, sludge belt conveyors, sludge grinders, and all related supportive equipment including control panels and associated wiring.

Challenges:

Phase Expenses

PHASE **Construction** Contract No PC-787 Phase Status Pending Close-out

Phase Title Replacement of Belt Filter Presses for Complex I and Upper Level Complex II

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	0	0	0	0	0	0

CIP Number: **213001**

PHASE	Study and Design and Construction Assistance	Contract No	CS-1483	Phase Status	Pending Close-out
Phase Title	Replacement of Belt Filter Presses for Complex I and Upper Level Complex II				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Pending Close-out
Contract No	PC-787
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Phase Category	S/D/CA
Budget	Wastewater
Phase Status	Pending Close-out
Contract No	CS-1483
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	29	1,872							0	1,901
2019	34,101	2,568	0	0	0	0	0	0	0	36,669

Description of CIP Changes

CIP Number: 213002

Old CIP No.: 1221

Project Title: WRRF Rehabilitation of Central Offload Facility

Project Status Active

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Residuals Management

Review Committee Project Score: 76.2

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Powdered lime discharges into the COF causing lime to discharge throughout the building making the scrubber system to fail

Project Significance: Refurbishment or replacement of COF equipment including sludge storage bins, conveyors, and lime offload system, scrubber system, HVAC etc., will improve reliability and performance. This improvement will enable WRRF to be in compliance with NPDES permit

Project Engineer/Manager: Alfredo Lava

Manager: Ali Khraizat

Scope of Work: The study, design and construction for the rehabilitation of the central offload facility includes bin activators, rotary feeder valves, knife gate valves, bottom hoppers, conveyors, and other associated items. The work also includes rehabilitation of HVAC system of the entire facility, lime offloading system, drainage system, elevator, and doors.

Challenges: Maintaining the MDEQ-NPDES required capacity during the construction phase of the project.

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No CS-1701 Phase Status Active

Phase Title Rehabilitation of Central Offload Facility

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	664	229	171	57	0	0	0

CIP Number: **213002**

PHASE	Construction	Contract No		Phase Status	Future Planned Start

Phase Title: Rehabilitation of Central Offload Facility

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	6,217	7,348	4,522	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
664	6,446	7,519	4,579	0	0	0

Phase Tasks and Dates

Phase Category: C
Budget: Wastewater
Phase Status: Future Planned Start
Contract No:
Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	7/20/2018	914	1/19/2021
Project Closeout	1/19/2021	60	3/20/2021

Phase Category: S/D/CA
Budget: Wastewater
Phase Status: Active
Contract No: CS-1701
Cost Est Class:

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	7/20/2018	914	1/19/2021
Project Closeout	1/19/2021	60	3/20/2021

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		800	5,850	6,750	4,350				0	17,750
2019	0	202	664	6,446	7,519	4,579	0	0	0	19,410

Description of CIP Changes: Estimated cost changed because previous estimate was too low without including Engineering services.

CIP Number: **213003**

Old CIP No.: 1253

Project Title: **WRRF Sewage Sludge Incinerator Air Quality Improvements**

Project Status Pending Closeout

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

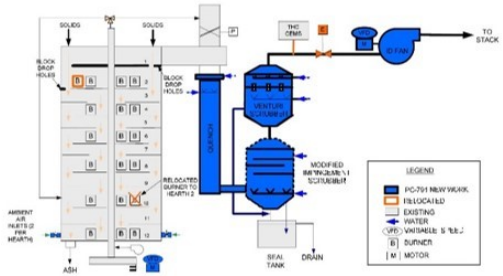
Classification Lvl 3: Residuals Management

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability



Schematic of incinerator air quality improvement equipment

Project Significance: Provide sludge incinerations air quality improvements at Incinerator Complex II to meet NPDES Permit requirements

Project Engineer/Manager: Kashmira Patel

Manager: Philip Kora

Scope of Work: This project involves the design and construction for sludge incinerator air quality improvements at Complex II Incinerator Facility at WRRF. The scope of work includes installation of new scrubber, induced draft fan, noise reduction modification, and air quality and monitoring equipment.

Challenges: N/A - Active

Phase Expenses

PHASE **Design and Build** Contract No PC-791 Phase Status Pending Close-out

Phase Title Sewage Sludge Incinerator Air Quality Improvements at WRRF

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
1,036	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
1,036	0	0	0	0	0	0

CIP Number: **213003**

Phase Tasks and Dates

Phase Category	DB
Budget	Wastewater
Phase Status	Pending Close-out
Contract No	PC-791
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	12/17/2012	1656	6/30/2017
Project Closeout	7/1/2017	167	12/15/2017

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	33,043	3,000							0	36,043
2019	34,544	16,091	1,036	0	0	0	0	0	0	51,671

Description of CIP Changes: Because of the March 2016 Fire, the completion of PC-791 work was delayed and emission testing and remaining punch list are expected to be done by December 2017.

CIP Number: 213004

Old CIP No.: 1254

Project Title: WRRF Biosolids Dryer Facility

Project Status Pending Closeout

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Residuals Management

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

New GLWA Biosolids Dryer Facility

Project Significance: Allows retirement of Complex I Incinerators. Will provide significant cost savings and is the largest Biosolids dryer facility in North America

Project Engineer/Manager: Darrel Field

Manager: Philip Kora

Scope of Work: This project provides for study, design and construction of a thermal dryer facility with a firm capacity of 330 dry tons per day (dtpd). The scope of work also includes a conveyance system from Complex I to Complex II.

Challenges: N/A - Pending Closeout

Phase Expenses

PHASE **Design and Build** Contract No PC-792 Phase Status Pending Close-out

Phase Title Biosolids Dryer Facility at WRRF

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
311	311	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
311	311	0	0	0	0	0

CIP Number: **213004**

Phase Tasks and Dates

Phase Category	DB
Budget	Wastewater
Phase Status	Pending Close-out
Contract No	PC-792
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	5/23/2013	1683	12/31/2017
Project Closeout	1/1/2018	180	6/30/2018

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	134,191	1,691	60	26					0	135,968
2019	1,439	585	311	311	0	0	0	0	0	2,646

Description of CIP Changes: Recycle bin modification work, scrubber installation to address the SO2 emission limit, and Air Emission testing are the outstanding work for this project.

CIP Number: 213005

Old CIP No.: 1284

Project Title: WRRF Complex I Incinerators Decommissioning and Reusability

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Residuals Management

Review Committee Project Score: 38.4

- [x] Innovation
- [ ] MP Right Sizin
- [ ] System Reliability

Complex – I Incinerator Building at the WRRF

Project Significance: This project will decommission the C-I Incinerators building and investigate the re-usability.

Project Engineer/Manager: Ravi Yelamanchi

Manager: Ali Khraizat

Scope of Work: Provide basis of design report for decommissioning of the Complex-I demolition and relocation drawings for existing pass through utilities. Provide recommendation for future reusability plan for Complex I. The demolition cost and construction assistance, and relocation of utilities is not included in this budgeted CIP. The budgeted CIP includes study, design and minimum rehabilitation to install heating to continue utilizing the building other than incinerations. The cost to demolish equipment and rehabilitate the existing building for reuse is very high and further capital investment is deferred until reuse need of this building is well defined.

Challenges: Possible challenges with this project will include shutdowns of the secondary water system and abatement of asbestos and lead for this building built 1940's. Some utility service lines may be shared with adjoining Complex II Incinerator and Complex I Dewa

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No Phase Status Future Planned Start

Phase Title Complex I Incinerators Decommissioning and Reusability at Wastewater Treatment Plant (WRRF)

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	0	0	159	91	91	57

CIP Number: **213005**

PHASE	Construction	Contract No		Phase Status	Future Planned Start

Phase Title: Complex I Incinerators Decommissioning and Reusability at Wastewater Treatment Plant (WRRF)

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	1,130	2,261	1,113

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	159	1,221	2,352	1,170

Phase Tasks and Dates

Phase Category: C
Budget: Wastewater
Phase Status: Future Planned Start
Contract No:
Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Scope Development	5/10/2021	180	11/6/2021
Procurement	11/6/2021	120	3/6/2022
Project Execution	3/7/2022	540	8/29/2023
Project Closeout	8/29/2023	60	10/28/2023

Phase Category: S/D/CA
Budget: Wastewater
Phase Status: Future Planned Start
Contract No:
Cost Est Class:

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	5/10/2021	180	11/6/2021
Procurement	11/6/2021	120	3/6/2022
Project Execution	3/7/2022	540	8/29/2023
Project Closeout	8/29/2023	60	10/28/2023

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			900	200					0	1,100
2019	0		0	0	0	159	1,221	2,352	1,170	4,902

Description of CIP Changes: Previous estimate was changed from last year.

CIP Number: 213006

Old CIP No.: 1309

Project Title: WRRF Improvements to Sludge Feed Pumps at Dewatering Facilities

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Residuals Management

Review Committee Project Score: 67.8

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Sludge Feed Pumps

Project Significance: Improved sludge feed pumping system will provide wide range of operating conditions.

Project Engineer/Manager: Ravi Yelamanchi

Manager: Ali Khraizat

Scope of Work: The scope of work includes study, design, and construction for the replacement of sludge feed pumps SFP 1, 2, 5 and 6 and other modifications to the pumping system at the WRRF.

Challenges: Maintaining Plant Operational Capacity during construction.

Phase Expenses

PHASE **Construction** Contract No Phase Status Future Planned Start

Phase Title Improvements to Sludge Feed Pumps at Dewatering Facilities

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	2,323	1,130	0

PHASE **Study and Design and Construction Assistance** Contract No Phase Status Future Planned Start

Phase Title Improvements to Sludge Feed Pumps at Dewatering Facilities

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
		57	274	68		

CIP Number: **213006**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	57	274	2,391	1,130	0

Phase Tasks and Dates

Phase Category: C

Budget: Wastewater

Phase Status: Future Planned Start

Contract No:

Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Scope Development	8/10/2020	180	2/6/2021
Procurement	2/6/2021	120	6/6/2021
Project Execution	6/7/2021	540	11/29/2022
Project Closeout	11/29/2022	60	1/28/2023

Phase Category: S/D/CA

Budget: Wastewater

Phase Status: Future Planned Start

Contract No:

Cost Est Class:

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	8/10/2020	180	2/6/2021
Procurement	2/6/2021	120	6/6/2021
Project Execution	6/7/2021	540	11/29/2022
Project Closeout	11/29/2022	60	1/28/2023

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		33	402	750					0	1,185
2019	1	3	0	0	57	274	2,391	1,130	0	3,856

Description of CIP Changes: The original BCE submitted for the 2018-2022 CIP estimated projected expenses at $3.3M for this project. Revisions made for the final 2018-2022 CIP at $1.2M were incorrect. Based upon revisiting the scope of work and the schedule, the 2019-2023 CIP projected expenses were slightly higher than the original BCE.

CIP Number: 213007

Old CIP No.: 1311

Project Title: WRRF Modification to Incinerator Sludge Feed Systems at Complex -II

Project Status Active

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

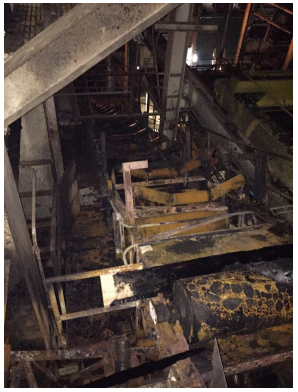
Classification Lvl 3: Residuals Management

Review Committee Project Score: 87.2

☐ Innovation

☐ MP Right Sizin

☐ System Reliability



Picture from left to right Sludge Conveyer G Damaged by Fire and Conveyer B in the Complex – II Dewatering Building and Fire Damaged Conveyer H in Complex-II Incinerators Building

Project Significance: GLWA have an ongoing study and design of sludge cake conveyance system improvements project after the March 4, 2016 fire incident in Complex –II Incinerators building. The construction of this project will provide a cleaner, fire resistant, reliable and safe sludge feed to the incinerators.

Project Engineer/Manager: Beena Chackunkal

Manager: Ali Khraizat

Scope of Work: The restoration of sludge conveying capacity, which was lost due to the fire damage and to provide improved sludge conveyance from each dewatering facility to the incinerators. Replacement of 19 MCCs and Replacement of the Unit Substation EB-26 in Incineration Complex II.

Challenges: Maintaining the sludge conveyance capacity to meet permit requirements during the construction of these improvements, will be the most significant challenge on this project.

Phase Expenses

PHASE **Construction** Contract No CON-197 Phase Status Under Procurement

Phase Title Modification to Incinerator Sludge Feed Systems at Complex -II

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	6,783	11,305	3,475	0	0	0	0

CIP Number: **213007**

PHASE	Study and Design and Construction Assistance	Contract No		Phase Status	Active
Phase Title	Wastewater Treatment Plant, Lift Station and Wastewater Collection System Structures Allowance				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
515	102	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
7,298	11,407	3,475	0	0	0	0

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Under Procurement
Contract No	CON-197
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	2/5/2018	720	1/26/2020
Project Closeout	1/26/2020		

Phase Category	S/D/CA
Budget	Wastewater
Phase Status	Active
Contract No	
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	2/5/2018	720	1/26/2020
Project Closeout	1/26/2020		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		1,500	9,600	7,822					0	18,922
2019	0		7,298	11,407	3,475	0	0	0	0	22,180

Description of CIP Changes: Additional scope to the previous CIP. Construction of two Small Capital Projects, Replacement of 19 MCCs and Replacement of the

CIP Number: **213007**

unit substation EB-26, were combined with this construction project to avoid multiple shut downs in Incineration Complex II and to coordinate the works more effectively. The estimated cost has also changed.

CIP Number: 213008

Old CIP No.: 1383

Project Title: WRRF Rehabilitation of the Ash Handling Systems

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Residuals Management

Review Committee Project Score: 57.8

- [x] Innovation
- [ ] MP Right Sizin
- [ ] System Reliability

Ash crusher system was last rehabilitated 15 years ago and near the end of its useful life, due to Complex I decommissioning dry ash system needs to be reconfigured and rehabilitated

Project Significance: The ash systems convey and store ash for ultimate disposal. The incinerators cannot be used if both the systems are not working.

Project Engineer/Manager: Alfredo Lava

Manager: Ali Khraizat

Scope of Work: The scope of work will include study, design, and construction for the rehabilitation of the wet and dry ash systems. The scope will also include the piping, valves, isolation gates, vacuum pumps, air filters, HVAC, boilers, miscellaneous silo repairs (concrete, access, etc.) site work and drainage, and miscellaneous structural repairs (foot bridge, spalling concrete, etc.) at the dry ash handling system. It will also include the pumps, piping, and sluicing system at the wet ash system.

Challenges: Maintaining the dry ash system at capacity while the wet ash system is being built will be a challenge.

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No Phase Status Future Planned Start

Phase Title Rehabilitation of the Ash Handling Systems

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	0	687	916	222	229	286

CIP Number: **213008**

PHASE	Construction	Contract No		Phase Status	Future Planned Start

Phase Title: Rehabilitation of the Ash Handling Systems

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	3,391	5,840	9,044

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	687	916	3,613	6,069	9,330

Phase Tasks and Dates

Phase Category: C
Budget: Wastewater
Phase Status: Future Planned Start
Contract No:
Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Scope Development	3/4/2021	180	8/31/2021
Procurement	8/31/2021	120	12/29/2021
Project Execution	12/30/2021	1080	12/14/2024
Project Closeout	12/14/2024	60	2/12/2025

Phase Category: S/D/CA
Budget: Wastewater
Phase Status: Future Planned Start
Contract No:
Cost Est Class:

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	3/4/2021	180	8/31/2021
Procurement	8/31/2021	120	12/29/2021
Project Execution	12/30/2021	1080	12/14/2024
Project Closeout	12/14/2024	60	2/12/2025

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			530	1,045	6,225	5,725	4,791		0	18,316
2019	0		0	0	687	916	3,613	6,069	9,330	20,615

Description of CIP Changes: Estimated construction cost has been modified since previous CIP.

CIP Number: 213009

Old CIP No.: 1399

Project Title: WRRF Phosphorous Recovery Evaluation

Project Status Cancelled

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: Residuals Management

Review Committee Project Score: 39.4

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Complex B Sludge Lines clogged due to Struvite

Project Significance: This study will evaluate the cost/benefit of harvesting phosphorous from the waste stream. A secondary benefit is the reduction in struvite formation/clogging in the plant piping

Project Engineer/Manager: Ravi Yelamanchi

Manager: Ali Khraizat

Scope of Work: The scope of work will be a study that includes: quantifying the amount of phosphorous in the sludge streams, estimating the potential amount of phosphorous that can be recovered, evaluating the potential market for recovered phosphorous, evaluating the alternatives for recovering phosphorous, developing an alternatives evaluation that includes life-cycle cost estimates and overall cost benefit analysis, identification of potential locations for a phosphorous recovery facility (if proven feasible), and preliminary layouts of facility equipment (if feasible).
Construction of the facility if feasible.

Challenges: Potential locations for a phosphorous recovery facility.

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No Phase Status Future Planned Start

Phase Title Phosphorous Recovery at WRRF

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	0	0	0	0	0	0

CIP Number: **213009**

PHASE	Construction	Contract No		Phase Status	Future Planned Start
Phase Title	Phosphorous Recovery at WRRF				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	3/10/2022	180	9/6/2022
Procurement	9/6/2022	120	1/4/2023
Project Execution	1/5/2023	720	12/25/2024
Project Closeout	12/25/2024	60	2/23/2025

Phase Category	S/D/CA
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	3/10/2022	180	9/6/2022
Procurement	9/6/2022	120	1/4/2023
Project Execution	1/5/2023	720	12/25/2024
Project Closeout	12/25/2024	60	2/23/2025

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018				500	2,000	6,250	6,250		0	15,000
2019	0		0	0	0	0	0	0	0	0

Description of CIP Changes

CIP Number: **214001**

Old CIP No.: 1285

Project Title: **WRRF Relocation of Industrial Waste Control Division and Analytical Laboratory Operations**

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

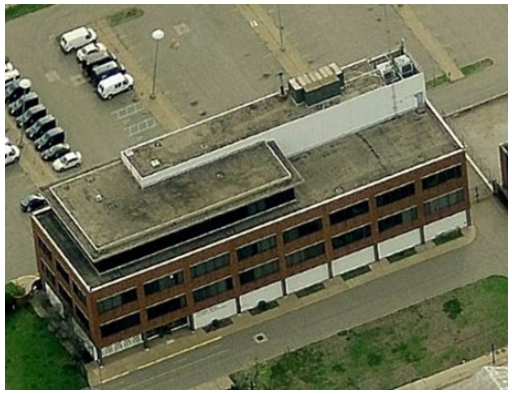
Classification Lvl 3: IWC

Review Committee Project Score: **62.2**

☐ Innovation

☐ MP Right Sizin

☐ System Reliability



Old IWC and Analytical Lab; new one will be built at the location of the WRRF because of Gordie Howe International Bridge Project

Project Significance: Laboratory Optimization, Continued operation of IWC and Lab, lease termination for analytical laboratory, and utilization of available space in WRRF NAB

Project Engineer/Manager: Beena Chackunkal

Manager: Ali Khraizat

Scope of Work: Relocate Industrial Waste Control Division and Analytical Lab to New Administration Building at WRRF. Consolidate the existing Operations Lab with Analytical Lab.

Challenges: Maintaining the laboratory operations during relocation.

Phase Expenses

PHASE **Construction** Contract No Phase Status Future Planned Start

Phase Title Construction of new Industrial Waste Control Division and Analytical Laboratory Operations

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	5,980	6,783	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	5,980	6,783	0	0	0	0

CIP Number: **214001**

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	1/4/2018	180	7/3/2018
Procurement	7/3/2018	120	10/31/2018
Project Execution	11/1/2018	540	4/24/2020
Project Closeout	4/24/2020	60	6/23/2020

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			5,000	2,000					0	7,000
2019	0	182	0	5,980	6,783	0	0	0	0	12,945

Description of CIP Changes: Estimated cost changed because the previous estimate was low. Refined the scope and Project History.

CIP Number: **215001**

Old CIP No.: 1384

Project Title: **CSO FACILITIES IMPROVEMENT PROGRAM (Reclassified)**

Project Status	Reclassified	☐	Innovation
Budget:	Wastewater	☐	MP Right Sizin
Classification Lvl 1:	Wastewater	☐	System Reliability
Classification Lvl 2:	WRRF		
Classification Lvl 3:	CSO RTB & SDF		
Review Committee Project Score:			

Retrofitted chemical feed pump replacement at Puritan-Fenkell RTB and makeshift wooden stairs to enter Basin Valve Gallery

Project Significance: PROJECT RECLASSIFIED TO CIP 260600. This program is being established to facilitate the study, design, construction administration, and construction of improvements necessary to maintain the facilities which contribute to the CSO Control Program and compliance herewith.

Project Engineer/Manager: Chris Nastally

Manager: Chris Nastally

Scope of Work: This program is intended to include studies, design, construction administration, and construction projects which serve to improve process areas or functions of the CSO Facilities. The overall scope of this program is to facilitate improvements to the disinfection systems, screening systems, facility automation, safety systems, flushing systems, instrumentation & controls, electrical systems, various buildings systems (HVAC, lighting, etc.), and other miscellaneous improvements identified at the facilities throughout the life of this program. The primary drivers of these improvements will be obsolescence/end of service life, excessive O&M problems, reliability, efficiency and system standardization which arise from feedback from operation & maintenance, the scheduled replacement plan, and the needs assessment.

Challenges: As this program starts off, there is a lot of design RFPs in the beginning which will lead to large scale construction projects in the later years (3-5). A significant challenge to be faced will be maintaining the CSO facilities in current operations without the benefit of large-scale improverments of the CSO Systems. Another significant challenge of this program will be unforseen conditions that may

CIP Number: **215001**

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

Description of CIP Changes	Costs for FY 2019 construction have increased due to the emergency nature of the required projects at the Conner Creek CSO Facility. There are costs for FY 19/20 for construction in the program that are placeholders in case any of the inspection programs under maintenance find issues with the facilities which are emergency in nature and require repair immediately. Furthermore, the costs from the 2018 CIP to the 2019 CIP have increased significantly, primarily in Fiscal Years 21,22,23, and 24 & Beyond. The primary reason for this is the items previously identified in the CIP were not laid out and grouped as projects to determine total project cost and lay out the projected completion of these projects from design-phase to construction-phase. Beginning in FY 18, a significant effort is anticipated by the emerging CSO Control Program Group to develop several RFPs seeking design-phase consulting assistance to complete the identified projects from the Needs Assessment, Scheduled Replacement Plan, and those identified by Operations/Maintenance as equipment which requires significant effort to maintain & operate or has failed. The RFPs and resulting design work are anticipated to ramp up heavily in FY20 with the fruits of those designs (construction projects) beginning construction in FY 21 and continuing through FY 23. Beyond FY 23 is a budgeted amount which will most likely change over the next fiscal year or two as more information is obtained in assessing the CSO Facilities condition and as efforts from the Wastewater Master Plan may affect the overall direction of the program. This same goes for the identified design (consulting) efforts which are presently shown to tail off in FY 22. As more projects become identified and prioritized, the design efforts for FY 22 and beyond will likely require adjustment under this program, or possibly could justify their own CIP project number and means of individual tracking.

CIP Number: 216001

Old CIP No.: 366

Project Title: Underground Electrical Duct Bank Repair and EB-1, EB-2 and EB-10 Primary Power Service Improvements

Project Status Pending Closeout

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: General Purpose

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Electrical Duct Bank

Project Significance: Procure and install electrical power system to meet safety standards and prove third redundant electric feeder per NPDES permit

Project Engineer/Manager: Phillip Kora

Manager: Philip Kora

Scope of Work: This project involves the study, design, and construction assistance work for repairing the 15KV Primary Switch Gears A & B, unit substation EB-1, EB-2, and EB-10, unit 5KV substation and switch gear DE-1, and two outdoor 3-phase primary transformers; and repair of building structure and associated components. The work will also include coordination of system shut-down, and coordination of system reconnection with new cables.

Challenges: N/A - Pending Closeout

Phase Expenses

PHASE **Construction** Contract No PC-783 Phase Status Pending Close-out

Phase Title Underground Electrical Duct Bank Repair and EB-1, EB-2 and EB-10 Primary Power Service Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
3,572						

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
3,572						

CIP Number: **216001**

Phase Tasks and Dates

Phase Category	C	**Construction**
Budget	Wastewater	
Phase Status	Pending Close-out	
Contract No	PC-783	
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	23,037	2,575	1,532						0	27,144
2019	30,564	1,072	3,572							35,208

Description of CIP Changes

CIP Number: **216002**

Old CIP No.: 1028

Project Title: **Plant-wide Fire Alarm Systems Upgrade/ Integration and Fire Protection Improvements**

Project Status Pending Closeout

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: General Purpose

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Fire alarm system

Project Significance: Install an integrated Fire Alarm system to facilitate centralized monitoring

Project Engineer/Manager: Vinod Sharma

Manager: Ali Khraizat

Scope of Work: This project involves the installation of an Integrated Plant-wide Fire Alarm System in approximately 100 buildings (of which 50+ have a stand-alone fire alarm system) at the WRRF in order to facilitate centralized monitoring and assure faster corrective action. The new system will be interfaced with the existing WRRF Control System.

Challenges: N/A - Pending Closeout

Phase Expenses

PHASE **Construction** Contract No PC-782 Phase Status Closed Out

Phase Title Plant-wide Fire Alarm Systems Upgrade/ Integration and Fire Protection Improvements

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	0	0	0	0	0	0

CIP Number: **216002**

PHASE	Study and Design and Construction Assistance	Contract No	CS-1443	Phase Status	Pending Close-out

Phase Title: Plant-wide Fire Alarm Systems Upgrade/ Integration and Fire Protection Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

Phase Tasks and Dates

Phase Category: C
Budget: Wastewater
Phase Status: Closed Out
Contract No: PC-782
Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Phase Category: S/D/CA
Budget: Wastewater
Phase Status: Pending Close-out
Contract No: CS-1443
Cost Est Class:

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	5,390	624							0	6,014
2019	347	503	0	0	0	0	0	0	0	850

Description of CIP Changes

CIP Number: **216003**

Old CIP No.: 1140

Project Title: **Study/ Repair Potable Water, Screened Final Effluent, Natural Gas and Compressed Air Pipe Lines at the WRRF**

Project Status Reclassified

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: General Purpose

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Review Committee Project Score: **55.6**

Project Significance: PROJECT RECLASSIFIED TO 216006. These utilities are vital to the operations of the WRRF. The integrity of these systems is necessary to operate the WRRF reliably.

Project Engineer/Manager:

Manager: Ali Khraizat

Scope of Work: The potable water supply to WRRF is experiencing low pressure problem. The study design and construction for the secondary water system improvements to improve reliability and water pressure to the WRRF ids required. Other tasks include repair/replace the aging and corroded pipes, valves and fittings for Potable Water Supply System. Repair/replace the aging and corroded pipes, valves and fittings for Natural Gas system. Repair/replace the aging and corroded pipes, valves and fittings for the SFE system. Repair/replace the aging and corroded pipes, valves and fittings for the Compressed Air System. Design and Install Compressed Air to supply the required air to the pneumatic tools in Pump Station #2.

Challenges: Temporary air, water, natural gas system shutdowns may be required to perform the work.

CIP Number: **216003**

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		50	690	1,900	1,150	1,200			0	4,990

Description of CIP Changes	Project has been reclassified under Project 216006

CIP Number: 216004

Old CIP No.: 1223

Project Title: Rehabilitation of Various Sampling Sites and PS#2 Ferric Chloride System at WRRF

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: General Purpose

Review Committee Project Score: 82.2

- [x] Innovation
- [ ] MP Right Sizin
- [ ] System Reliability

The RAS-3 sampling station in the basement of Intermediate Lift Pump No. 2 (ILP No. 2) Building samples the return activated sludge flows to Aeration Deck No.4

Project Significance: Rehabilitation of the sampling facilities will improve system reliability and allow for consistent and accurate sampling. This will help to submit an accurate report to MDEQ. The rehabilitation of Ferric Chloride system will improve the phosphorous removal to comply with the Permit.

Project Engineer/Manager: Beena Chackunkal

Manager: Ali Khraizat

Scope of Work: The scope of work includes:
Replacement of existing sampling equipment, installing new samplers, pumps, piping, housing and support equipment such as I&C, HVAC, etc. at the various sampling sites.
The scope also include:
Replacement of existing two steel Ferric Chloride tanks at PS#2 with four (4) smaller tanks.
Provide new piping layout, gravity feed, and self-cleaning strainer.
Rehabilitate Ferric Chloride Unloading station, associated Valves and Appurtenances.
Provide Flow meters and new control strategies to meet future demands of Ferric Chloride at Pump Station # 2.
The CIP is for construction only.

Challenges: Maintaining the MDEQ-NPDES required capacity during the construction phase of the project.

Phase Expenses

PHASE	Construction	Contract No		Phase Status	Future Planned Start
Phase Title	Rehabilitation of Grit and Screening System at PS-2 and Rehabilitation of Sampling Sites at WRRF				

CIP Number: **216004**

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
590	3,956	565	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
590	3,956	565	0	0	0	0

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement	12/1/2017	120	3/31/2018
Project Execution	4/2/2018	540	9/24/2019
Project Closeout	9/24/2019	60	11/23/2019

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			2,500	2,500					0	5,000
2019	0	312	590	3,956	565	0	0	0	0	5,423

Description of CIP Changes: Refined scope.

CIP Number: 216005

Old CIP No.: 1237

Project Title: Rehabilitation of the Main Plant Maintenance Building & Other Maintenance Areas and Improvement of Work Environment

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

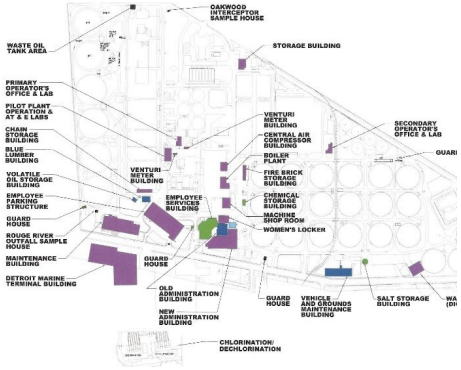
Classification Lvl 3: General Purpose

Review Committee Project Score: 60

☐ Innovation

☐ MP Right Sizin

☐ System Reliability



Support facilities at the WRRF

Project Significance: Rehabilitate permanent structure to maximize the occupancy and eliminate unnecessary temporary structures.

Project Engineer/Manager: Beena Chackunkal

Manager: Ali Khraizat

Scope of Work: Study and Evaluate the existing maintenance facilities throughout the plant for suitable modifications to provide sufficient storage and better maintenance areas. The various building systems, including heating, ventilation, electrical, and lighting would be improved to be in compliance with applicable building codes and regulations.
Construction of the suggested modifications will follow.

Challenges: Requires significant input from Operations and Maintenance due to changes in the organizational structure and functions since the original CIP proposal approved on 03/11/11. Also, require temporary work spaces to accommodate new rehabilitation of the existing maintenance areas.

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No Phase Status Future Planned Start

Phase Title Rehabilitation of the Main Plant Maintenance Building, Replacement of Various Plant Maintenance Areas and Work Environment Improve

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	0	0	629	629	114	229

CIP Number: **216005**

PHASE	Construction	Contract No		Phase Status	Future Planned Start

Phase Title: Rehabilitation of the Main Plant Maintenance Building, Replacement of Various Plant Maintenance Areas and Work Environment Improve

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	3,441	13,566

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	629	629	3,555	13,795

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	1/6/2022	180	7/5/2022
Procurement	7/5/2022	120	11/2/2022
Project Execution	11/3/2022	1080	10/18/2025
Project Closeout	10/18/2025	60	12/17/2025

Phase Category	S/D/CA
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	1/6/2022	180	7/5/2022
Procurement	7/5/2022	120	11/2/2022
Project Execution	11/3/2022	1080	10/18/2025
Project Closeout	10/18/2025	60	12/17/2025

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			1,500	6,000	5,400				0	12,900
2019	0		0	0	0	629	629	3,555	13,795	18,608

Description of CIP Changes: Estimated cost changed with refined scope.

CIP Number: 216006

Old CIP No.: 1381

Project Title: Rehabilitation of Potable Water, Screened Final Effluent (SFE), Natural Gas, Secondary Water System and Compressed Air Pipelines & SFE Pump Station

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: General Purpose

Review Committee Project Score: 78.6

- [x] Innovation
- [ ] MP Right Sizin
- [ ] System Reliability

Significant SFE & Secondary Water Pump Station and pipe corrosion, requiring equipment and building rehabilitation. No redundancy for power supply to SFE pump station. Latest cooling oil test (DGA) indicates potential issues with two 5kV Transformers

Project Significance: The utilities are vital to the operations of the WRRF. The integrity of these systems will be maintained with this project. The SFE Pump Station provides SFE water to many of the GLWA WRRF treatment processes and needs to be completely rehabilitated to maintain uninterrupted supply of SFE water to these processes. The Secondary Water system needs to be relocated or completely refurbished to provide uninterrupted water for fire protection and process applications such as seal water to the pumps.

Project Engineer/Manager: Ali Khraizat

Manager: Ali Khraizat

Scope of Work: This project will include the study, design, and construction for the needed improvements to the SFE and Secondary Water pump stations. This includes required capacity, pumps, strainers, piping, controls, building improvements, and electrical supply. It is possible that the secondary water system may need to be relocated. This will also include a study to evaluate the potential for replacing the secondary water utilization with SFE utilization where feasible and an alternative analysis to the existing carrier water at chlorination/dechlorination facility. The distribution models for both water systems will also be updated. A redundant potable water feed to the WRRF will also be evaluated. The evaluation of all alternatives will include the ability to reduce energy and potable water usage.

This project will also include study, design and construction of the repair/replacement of the aging and corroded pipes, valves and fittings for the Potable Water Supply System, the Natural Gas system, the SFE system, and the Compressed Air System.
The As Builts for all the utilities will be generated as part of this project.

CIP Number: **216006**

Challenges: Maintaining the adequate supply of SFE and Secondary Water to the other treatment processes during construction of the SFE improvements, will be the most significant challenge on this project. Temporary air, water, natural gas system shutdowns may also be required to perform the work.

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No Phase Status Future Planned Start

Phase Title Rehabilitation of the Screened Final Effluent (SFE) Pump Station and Secondary Water System

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	1,717	4,007	572	572	286

PHASE **Construction** Contract No Phase Status Future Planned Start

Phase Title Rehabilitation of the Screened Final Effluent (SFE) Pump Station and Secondary Water System

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	6,602	16,957	23,740

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	1,717	4,007	7,174	17,529	24,026

Phase Tasks and Dates

Phase Category C

Budget Wastewater

Phase Status Future Planned Start

Contract No

Cost Est Class

Construction

Task Name	Start Date	Duration	End Date
Scope Development	1/7/2021	180	7/6/2021
Procurement	7/6/2021	120	11/3/2021
Project Execution	11/4/2021	1080	10/19/2024
Project Closeout	10/19/2024	60	12/18/2024

CIP Number: **216006**

Phase Category	S/D/CA
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	1/7/2021	180	7/6/2021
Procurement	7/6/2021	120	11/3/2021
Project Execution	11/4/2021	1080	10/19/2024
Project Closeout	10/19/2024	60	12/18/2024

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			1,700	2,000	12,000	15,600	16,279	4,141	0	51,720
2019	0		0	0	1,717	4,007	7,174	17,529	24,026	54,453

Description of CIP Changes	Combined CIP 1140 (New number 216003) with this CIP 1381(New number 216006). Therefore, the total estimated cost for this CIP has changed.

CIP Number: 216007

Old CIP No.: 1402

Project Title: DTE Primary Electric 3rd Feed Supply to WRRF

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: General Purpose

Review Committee Project Score: 82.8

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

The new 3rd 120/13.8 kV Transformer installed and owned by the Great Lakes Water Authority waiting for the 3rd Primary Electric Feed Line to be installed and energized

Project Significance: GLWA's WWTP will have a redundant primary electrical service to power the WRRF equipment.

Project Engineer/Manager: Phillip Kora

Manager: Philip Kora

Scope of Work: The scope of this design-build project includes design and construction of 3rd 120 kV primary electric supply transmission line owned by DTE tapping into the 120-kV Waterman-Zug line in the vicinity of Dearborn St. and Copland St right-of-way at Tower 1368. The design-build services also include securing the property right-of-way easements from the property owners, as well as the design and construction of power transmission supply line. This primary transmission power line will energize the already installed new 120-13.8 industrial substation owned by GLWA near EB-1.

Challenges: Negotiation with private property owners and testing of the automatic switch over will require co-ordination with operations.

Phase Expenses

PHASE **Construction** Contract No Phase Status Future Planned Start

Phase Title DTE Primary Electric 3rd Feed Supply to WRRF

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	3,326	3,326	0	0	0	0

CIP Number: **216007**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	3,326	3,326	0	0	0	0

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	7/1/2017	219	2/5/2018
Procurement	2/5/2018	120	6/5/2018
Project Execution	6/6/2018	365	6/6/2019
Project Closeout	6/6/2019	60	8/5/2019

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			3,500	3,500					0	7,000
2019	0	15	0	3,326	3,326	0	0	0	0	6,667

Description of CIP Changes: The estimated cost went down because some of the scope was already done. The project has changed from Design/Build to Construction only.

CIP Number: **222001**

Old CIP No.: 1286

Project Title: **Oakwood District Intercommunity Relief Sewer Modification at Oakwood District**

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: Field Services

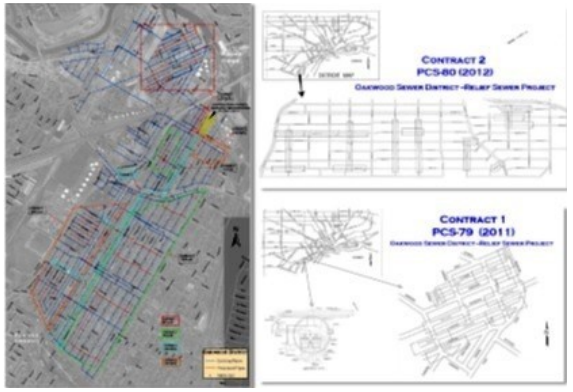
Classification Lvl 3: Interceptors

Review Committee Project Score: **51.8**

☐ Innovation

☐ MP Right Sizin

☐ System Reliability



Aerial photo, far left, of Oakwood Sewer District depicting previously designed relief sewers tributary to Oakwood Pump Station and CSO Retention Treatment Basin. Part of the planned relief sewers and associated hydraulic structures were constructed betwe

Project Significance: Improvements to the Oakwood District Sanitary Sewer system and implementation of various projects as recommended in report by Applied Sciences, Inc. Dated 2/26/16. Projects to include: 1) Clean & Inspect Trunk Sewers, 2) Analysis and improvement of Oakwood PS/RTB operations, 3) Second influent sewer to Oakwood PS, and 4) NWI Diversion for CSO Control. Projects to be prioritized and validated as part of Wastewater Master Plan Project (GLWA CS-036).

Project Engineer/Manager: Todd King

Manager: Todd King

Scope of Work: The work includes basis of design (study) report on alternative solution to proposed Oakwood District Intercommunity Relief Sewer, diversion of storm water flow, and construction assistance during construction phase of emerging projects. Coordinate with DWSD projects including catch basin restrictions and green spaces.

Challenges: Maintaining the wet weather contract capacities and adequate CSO treatment during extreme storm events and mitigate basement and street flooding in the District and intercommunity regional districts are the most significant challenges for the project to address.

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title Oakwood District Intercommunity Relief Sewer Modification at Oakwood District

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	12,000	12,200	11,000	0	0

CIP Number: **222001**

PHASE	Study and Design and Construction Assistance	Contract No	NA	Phase Status	Future Planned Start
Phase Title	Oakwood District Intercommunity Relief Sewer Modification at Oakwood District				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	600	1,200	500	500	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	600	13,200	12,700	11,500	0	0

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	8/1/2021	90	10/30/2021
Procurement	10/30/2021	180	4/28/2022
Project Execution	4/28/2022	720	4/17/2024
Project Closeout	4/17/2024	60	6/16/2024

Phase Category	S/D/CA
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	8/1/2021	90	10/30/2021
Procurement	10/30/2021	180	4/28/2022
Project Execution	4/28/2022	720	4/17/2024
Project Closeout	4/17/2024	60	6/16/2024

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018				550	2,750	5,500	2,200		0	11,000
2019	0		0	600	13,200	12,700	11,500	0	0	38,000

Description of CIP Changes: According to ASI Feb 2016 report, there are six projects that should be considered to address the issues within the Oakwood

CIP Number: **222001**

District. These total approximately $38 million at a conceptual level of detail. The Wastewater Master Plan will review these projects in the context of the overall needs of the GLWA system and develop a comprehensive set of projects to address the Oakwood District. This project will be updated with the results of the Wastewater Master Plan when available.

CIP Number: 222002

Old CIP No.: 1329

Project Title: Detroit River Interceptor (DRI) Evaluation and Rehabilitation

Project Status Active

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: Field Services

Classification Lvl 3: Interceptors

Review Committee Project Score: 65.4

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Visual inspection of a large sewer

Project Significance: Evaluation of the existing condition of the Detroit River interceptor (DRI), and rehabilitation/replacement of portions based on the evaluation results are essential to optimize the transportation capacity of the GLWA collection system and to increase its service life.

Project Engineer/Manager: Mini Panicker

Manager: Biren Saparia

Scope of Work: Preliminary Scope of Work of the Project is as follows: Review the existing records, investigate the existing conditions , provide the necessary cleaning/rehabilitation/replacement to optimize the design capacity of the collection system and to minimize the inflow and infiltration into the collection system.

Challenges: DRI may have flow control challenges for both inspection and rehabilitation. Recommendations from these inspections may reveal further need for cleaning, rehabilitation or replacement.

Phase Expenses

PHASE **Construction** Contract No Con-183 Phase Status Active

Phase Title Detroit River Interceptor (DRI) Evaluation and Rehabilitation

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	2,231	0	0	0	0	0	0

CIP Number: **222002**

PHASE	Design and Build	Contract No	NA	Phase Status	Future Planned Start

Phase Title: Future Projects for DRI under SRF Funding

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	11,569	6,600				

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,231	11,569	6,600	0	0	0	0

Phase Tasks and Dates

Phase Category: C
Budget: Wastewater
Phase Status: Active
Contract No: Con-183
Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Scope Development	5/1/2017	30	5/31/2017
Procurement	6/1/2017	120	9/29/2017
Project Execution	10/1/2017	912	3/31/2020
Project Closeout	4/1/2020	90	6/30/2020

Phase Category: DB
Budget: Wastewater
Phase Status: Future Planned Start
Contract No: NA
Cost Est Class:

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development	5/1/2017	30	5/31/2017
Procurement	6/1/2017	120	9/29/2017
Project Execution	10/1/2017	912	3/31/2020
Project Closeout	4/1/2020	90	6/30/2020

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		321	10,000	5,000	5,000				0	20,321
2019	0	5	2,231	11,569	6,600	0	0	0	0	20,405

Description of CIP Changes: CON-183, DRI Repair/Rehabilitation in the Downtown Area is a project that is going for construction in 9/2017. GLWA has

CIP Number: **222002**

requested SRF funding for the rehabilitation of DRI. Availability of this funding is a deciding factor for the execution of the rest of the projects under this program. No projections are made. Shifted FY2018 & 2019 funds for Future Projects for DRI under SRF Funding

CIP Number: 222003

Old CIP No.: 1332

Project Title: North Interceptor East Arm (NIEA) Evaluation and Rehabilitation

Project Status Future Planned

Budget: Wastewater

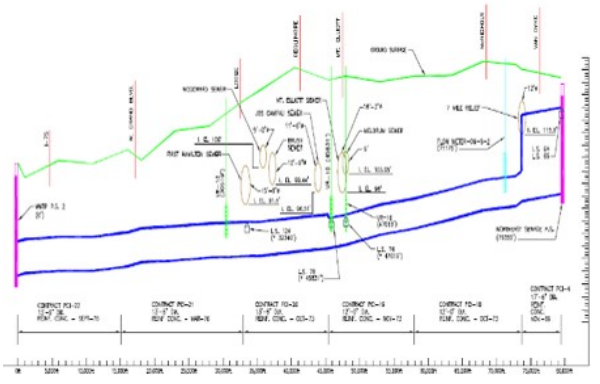
Classification Lvl 1: Wastewater

Classification Lvl 2: Field Services

Classification Lvl 3: Interceptors

Review Committee Project Score: 65.4

- [x] Innovation
- [ ] MP Right Sizin
- [ ] System Reliability



Elevation profile of part of the NIEA

Project Significance: Evaluation of the existing condition of NIEA, and rehabilitation/replacement of portions with structural deficiencies based on the evaluation results are essential to optimize the transportation capacity of the GLWA collection system and to increase its service life

Project Engineer/Manager: Todd King

Manager: Todd King

Scope of Work: Provide CCTV and or sonar inspection of the NIEA to reveal the existing conditions as per the National Association of Sewer Service Companies' (NASSCO) Pipeline Assessment Certification Program (PACP) standards, evaluate the existing conditions, and provide the necessary cleaning/rehabilitation/replace to optimize the design capacity of the collection system, minimize the inflow and infiltration into the collection system, and to extend the service life.

Challenges: NIEA may have flow control challenges for both inspection and rehabilitation.

Phase Expenses

PHASE **Construction** | Contract No NA | Phase Status Future Planned Start

Phase Title North Interceptor East Arm (NIEA) Evaluation and Rehabilitation

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	10,120	11,130	2,760	0	0	0

CIP Number: **222003**

PHASE	**Design**	Contract No	NA	Phase Status	Future Planned Start
Phase Title	North Interceptor East Arm (NIEA) Evaluation and Rehabilitation				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	550	530	150	0	0	0

PHASE	**Study**	Contract No	NA	Phase Status	Future Planned Start
Phase Title	North Interceptor East Arm (NIEA) Evaluation and Rehabilitation				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	330	340	90	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	11,000	12,000	3,000	0	0	0

Phase Tasks and Dates

Phase Category	C	**Construction**
Budget	Wastewater	
Phase Status	Future Planned Start	
Contract No	NA	
Cost Est Class		

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Phase Category	D	**Design**
Budget	Wastewater	
Phase Status	Future Planned Start	
Contract No	NA	
Cost Est Class		

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

CIP Number: **222003**

Phase Category	S
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Study

Task Name	Start Date	Duration	End Date	
Scope Development				
Procurement				
Project Execution				
Project Closeout				

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			11,000	12,000	3,000				0	26,000
2019	0		0	11,000	12,000	3,000	0	0	0	26,000

Description of CIP Changes	This project is for the OMID portion of NIEA. No projects have been initiated yet. Projects under this program depend on the future ownership of this. No projections are made from a timing perspective.

CIP Number: **222004**

Old CIP No.: 1392

Project Title: **Collection System Valve Remote Operation Structure Improvements**

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: Field Services

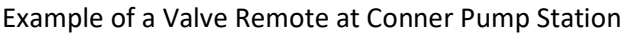
Classification Lvl 3: Interceptors

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Review Committee Project Score: **68.2**



Example of a Valve Remote at Conner Pump Station

Project Significance: VR-Gates are operational elements in the collection system that help in minimizing the untreated overflows and maximizing the flows to the wastewater treatment plant and CSO control facilities.

Project Engineer/Manager: Mini Panicker

Manager: Biren Saparia

Scope of Work: Evaluate the existing conditions of the VR-Gates and their structures, provide the necessary design for the replacement of the SCUBA actuators and rehabilitation of the structures, purchase and replace.

Challenges: These are operational elements, so flow control may be a challenge.

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title Collection System Valve Remote Operation Structures Improvements

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	1,018	1,014	0	0	0	0

CIP Number: **222004**

PHASE **Design** | Contract No NA | Phase Status Future Planned Start

Phase Title: Collection System Valve Remote Operation Structures Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

PHASE **Study** | Contract No NA | Phase Status Future Planned Start

Phase Title: Collection System Valve Remote Operation Structures Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
341	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
341	1,018	1,014	0	0	0	0

Phase Tasks and Dates

Phase Category: C | Budget: Wastewater | Phase Status: Future Planned Start | Contract No: NA | Cost Est Class:

Construction

Task Name	Start Date	Duration	End Date
Scope Development	10/11/2018	10	10/21/2018
Procurement	10/21/2018	120	2/18/2019
Project Execution	2/19/2019	413	4/7/2020
Project Closeout	4/8/2020	83	6/30/2020

Phase Category: D | Budget: Wastewater | Phase Status: Future Planned Start | Contract No: NA | Cost Est Class:

Design

Task Name	Start Date	Duration	End Date
Scope Development	10/11/2018	10	10/21/2018
Procurement	10/21/2018	120	2/18/2019
Project Execution	2/19/2019	413	4/7/2020
Project Closeout	4/8/2020	83	6/30/2020

CIP Number: **222004**

Phase Category	S
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Study

Task Name	Start Date	Duration	End Date
Scope Development	10/11/2018	10	10/21/2018
Procurement	10/21/2018	120	2/18/2019
Project Execution	2/19/2019	413	4/7/2020
Project Closeout	4/8/2020	83	6/30/2020

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			341	1,000	1,422				0	2,763
2019	0		341	1,018	1,014	0	0	0	0	2,373

Description of CIP Changes: Study and Design from FY 2018 is moved to FY 2019. All expenses for study and design combined.

CIP Number: **222005**

Old CIP No.: 1393

Project Title: **Collection System Access Hatch Improvements**

Project Status Reclassified

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: Field Services

Classification Lvl 3: Interceptors

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Review Committee Project Score: **56.4**

Project Significance: RECLASSIFIED AND INLCUDED IN 260500: CSO OUTFALL REHABILATION. Access Hatches are structures in the collection system to provide reliable access to buried equipment and pipe lines. Many are deteriorated and dangerous to operate.

Project Engineer/Manager: Mini Panicker

Manager: Biren Saparia

Scope of Work: Locate the deteriorating access hatches, evaluate the existing conditions, provide the necessary replacement/ rehabilitation to minimize the inflow into the collection system and underground structures. Access hatches in the collection system are installed under various projects for providing access to underground vaults and equipment.

Challenges: NA

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title Collection System Access Hatch Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

CIP Number: **222005**

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			3,196	2,000	2,001				0	7,197
2019	0		0	0	0	0	0	0	0	0

Description of CIP Changes

Need to discuss possible combining of CIP 1393, CIP 1357 and CIP 1409

222005 , 222006, 233001 combine into a program for CSO Outfall Rehabilitation

CIP Number: **222006**

Old CIP No.: 1409

Project Title: **CSO Outfall Rehabilitation**

Project Status	Reclassified	☐ Innovation
Budget:	Wastewater	☐ MP Right Sizin
Classification Lvl 1:	Wastewater	☐ System Reliability
Classification Lvl 2:	SCC	
Classification Lvl 3:	Interceptors	

Review Committee Project Score:

Project Significance: RECLASSIFIED BECAUSE PROJECT PROJECTED EXPENSES MOVED INTO NEW PROGRAM 260500. Rehabilitation of the CSO outfalls is essential to properly discharge the uncontrollable combined sewer overflows to the receiving waters and to prevent sewer back up into the Conveyance System. Recent inspections of the outfalls revealed structural deficiencies like fractures, missing mortar from bricks etc. There are sediment and debris deposits in many of them.

Project Engineer/Manager: Mini Panicker

Manager: Biren Saparia

Scope of Work: Preliminary Scope of Work of the project is construction. Contract CS-168 will review the existing records, evaluate the existing conditions, and provide the necessary design to rehabilitate the outfalls.

Challenges: Some outfalls are below the river elevation; rehabilitation may be challenging.

CIP Number: **222006**

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

Description of CIP Changes

CIP Number: 222007

Old CIP No.: 1411

Project Title: NIEA Evaluation and Rehabilitation from WRRF to Gratiot Ave. and Sylvester St.

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: Field Services

Classification Lvl 3: Interceptors

Review Committee Project Score: 72.8

- [x] Innovation
- [ ] MP Right Sizin
- [ ] System Reliability

Example inspection of a large sewer

Project Significance: Evaluation of the existing condition of NIEA, and rehabilitation/replacement of portions with structural deficiencies based on the evaluation results are essential to optimize the transportation capacity of the GLWA collection system and to increase its life expectancy.

Project Engineer/Manager: Todd King

Manager: Todd King

Scope of Work: Preliminary Scope of Work of the Project is as follows: Review available data, provide the necessary rehabilitation/replacement option, design and implement them to optimize the design capacity of the collection system, minimize the inflow and infiltration into the collection system, and extend the service life.

Challenges: NIEA may have flow control challenges for both inspection and rehabilitation.

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title NIEA Evaluation and Rehabilitation from WRRF to Gratiot Ave. and Sylvester St.

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	6,300	6,300	6,300	0	0	0

CIP Number: **222007**

PHASE	Design	Contract No	NA	Phase Status	Future Planned Start

Phase Title: NIEA Evaluation and Rehabilitation from WRRF to Gratiot Ave. and Sylvester St.

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	700	700	700	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	7,000	7,000	7,000	0	0	0

Phase Tasks and Dates

Phase Category: C

Construction

Budget: Wastewater

Phase Status: Future Planned Start

Contract No: NA

Cost Est Class:

Task Name	Start Date	Duration	End Date
Scope Development	12/1/2018	730	11/30/2020
Procurement	1/1/2019	730	12/31/2020
Project Execution	12/1/2018	850	3/30/2021
Project Closeout	4/1/2021	90	6/30/2021

Phase Category: D

Design

Budget: Wastewater

Phase Status: Future Planned Start

Contract No: NA

Cost Est Class:

Task Name	Start Date	Duration	End Date
Scope Development	12/1/2018	730	11/30/2020
Procurement	1/1/2019	730	12/31/2020
Project Execution	12/1/2018	850	3/30/2021
Project Closeout	4/1/2021	90	6/30/2021

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			7,000	7,000	7,000				0	21,000
2019	0		0	7,000	7,000	7,000	0	0	0	21,000

Description of CIP Changes: Moved $7 M from FY 2018 to FY 2020. Inspection of this stretch of NIEA needs lots of coordination with OMID and is not

CIP Number: **222007**

completed yet. Inspection must be completed to reveal the existing conditions and then to plan on design and rehabilitation/ repair.

CIP Number: **232001**

Old CIP No.: 1241

Project Title: **Fairview Pumping Station - Replace Four Sanitary Pumps**

Project Status Active

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: SCC

Classification Lvl 3: Pumping Stations

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Sanitary pumps at Fairview Pumping Station

Project Significance: Replacement and upgrade of pumping equipment's to improve transportation of waste water to the treatment plant

Project Engineer/Manager: Jorge Nicolas

Manager: Grant Gartrell

Scope of Work: The scope of work consists of the study, design, and construction for four new pumping systems including inlet and discharge valves and wet well hydraulics. This will also include enlarging doorways, revamping roadways, and upgrading electrical and control systems.

Challenges: N/A - Active

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title Fairview Pumping Station - Replace Four Sanitary Pumps

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	11,600	13,920	3,480	0	0	0

PHASE **Design & Construction Assistance** Contract No CS-1747 Phase Status Active

Phase Title Fairview Pumping Station - Replace Four Sanitary Pumps

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
508	494	494	494	0	0	0

CIP Number: **232001**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
508	12,094	14,414	3,974	0	0	0

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	4/27/2016	765	6/1/2018
Procurement	6/1/2018	92	9/1/2018
Project Execution	9/1/2018	761	10/1/2020
Project Closeout	10/1/2020	92	1/1/2021

Phase Category	D/CA
Budget	Wastewater
Phase Status	Active
Contract No	CS-1747
Cost Est Class	

Design & Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	4/27/2016	765	6/1/2018
Procurement	6/1/2018	92	9/1/2018
Project Execution	9/1/2018	761	10/1/2020
Project Closeout	10/1/2020	92	1/1/2021

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	128	472	2,100	14,350	15,350				0	32,400
2019	0	778	508	12,094	14,414	3,974	0	0	0	31,768

Description of CIP Changes: Updated Project Prioritization and project expenses. Also updated phase tasks and dates.

CIP Number: 232002

Old CIP No.: 1315

Project Title: Freud & Conner Creek Pump Station Improvements

Project Status Active

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: SCC

Classification Lvl 3: Pumping Stations

Review Committee Project Score: 79.6

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Freud Pump Station

Project Significance: The primary objective of this project is to study the overall performance of Connor Creek and Freud sewage pumping stations and develop design, and build an operational strategy to optimize the utilization of interconnected piping and operation between both pumping stations and the Connor Creek Retention and Treatment Basin.

Project Engineer/Manager: Mini Panicker

Manager: Biren Saparia

Scope of Work: Provide basis of design, and final design for an operational strategy to optimize the utilization of interconnected piping and operation between Connor Creek and Freud pumping stations and the Connor Creek Retention and Treatment Basin. Provide construction of the emerging project and construction assistance during construction of the emerging project.

Challenges: Meeting the collection system transport capacity during the construction

Phase Expenses

PHASE	Construction	Contract No	PO-3785	Phase Status	Closed Out
Phase Title					

Phase Total

CIP Number: **232002**

PHASE	**Construction**	Contract No	PO-3786	Phase Status	Closed Out
Phase Title	PO-3786, Vacuum priming system validation				

Phase Total

PHASE	**Construction**	Contract No	NA	Phase Status	Future Planned Start
Phase Title	Construction phase from CS-120				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	5,004	8,000				

PHASE	**Construction**	Contract No	PO-3784	Phase Status	Closed Out
Phase Title	PO-3784, Roof upgrade and structural repairs for Conner Pump Station				

Phase Total

PHASE	**Study and Design and Construction Assistance**	Contract No	CS-120	Phase Status	Active
Phase Title	CS-120, Freud & Conner Creek Pump Station Improvements				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
3,180	621	317	250	0	0	0

PHASE	**Construction**	Contract No	CON-109	Phase Status	Active
Phase Title	CON-109, Freud & Conner Creek Pump Station Improvements				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,430	0	0	0	0	0	0

PHASE	**Construction**	Contract No	PO-3783	Phase Status	Closed Out
Phase Title	PO-3783, Conner PLC upgrades				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond

CIP Number: **232002**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
5,610	5,625	8,317	250	0	0	0

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Closed Out
Contract No	PO-3783
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Project Closeout	9/30/2016	273	6/30/2017

Phase Category	C
Budget	Wastewater
Phase Status	Active
Contract No	CON-109
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Project Closeout	9/30/2016	273	6/30/2017

Phase Category	C
Budget	Wastewater
Phase Status	Closed Out
Contract No	PO-3784
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Project Closeout	9/30/2016	273	6/30/2017

CIP Number: **232002**

Phase Category	C
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Project Closeout	9/30/2016	273	6/30/2017

Phase Category	C
Budget	Wastewater
Phase Status	Closed Out
Contract No	PO-3786
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Project Closeout	9/30/2016	273	6/30/2017

Phase Category	C
Budget	Wastewater
Phase Status	Closed Out
Contract No	PO-3785
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Project Closeout	9/30/2016	273	6/30/2017

Phase Category	S/D/CA
Budget	Wastewater
Phase Status	Active
Contract No	CS-120
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Project Closeout	9/30/2016	273	6/30/2017

CIP Number: **232002**

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		8,040	5,900	5,100	2,460	1,000			0	22,500
2019	0	2,101	5,610	5,625	8,317	250	0	0	0	21,903

Description of CIP Changes	2017 Construction expenses were only $2.77 M, so the rest of the funds are moved to future years. The construction project from CS-120 will be initiated in 2019, so $1M from 2021 is moved to year 2020. We anticipate a much higher construction cost and will be available only after the BOD workshop. Once it is available we will request more funding for future years up to 2022.

CIP Number: 232003

Old CIP No.: 1331

Project Title: Northeast Pumping Station

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: SCC

Classification Lvl 3: Pumping Stations

Review Committee Project Score: 89

- [x] Innovation
- [ ] MP Right Sizin
- [ ] System Reliability

Pump at the Northeast Pumping Station

Project Significance: This project will include replacement of the inlet gate valves, installation of Pump No. 3 and new chopper pumps, repair of the original service elevator, rebuilding of the spare pumps, repair and upgrade of the wet well, repair and upgrade of the dry well, repair and upgrade of the Gate House air handling systems, emergency bypass of the station, etc.

Project Engineer/Manager: Mini Panicker

Manager: Biren Saparia

Scope of Work: Provide basis of design, and final design for a complete rehabilitation for the station with an emergency bypass option. Provide construction of the emerging project and construction assistance during construction.

Challenges: Meeting the collection system transport capacity during the construction

Phase Expenses

PHASE **Construction** | Contract No NA | Phase Status Future Planned Start

Phase Title Northeast Pumping Station

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	0	10,920	13,000	0	0	0

CIP Number: **232003**

PHASE	**Design**	Contract No	NA	Phase Status	Future Planned Start

Phase Title: Northeast Pumping Station

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	1,628	0	0	0	0	0

PHASE	**Study**	Contract No	NA	Phase Status	Future Planned Start

Phase Title: Northeast Pumping Station

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	780	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	2,408	10,920	13,000	0	0	0

Phase Tasks and Dates

Phase Category	C	**Construction**
Budget	Wastewater	
Phase Status	Future Planned Start	
Contract No	NA	
Cost Est Class		

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Phase Category	D	**Design**
Budget	Wastewater	
Phase Status	Future Planned Start	
Contract No	NA	
Cost Est Class		

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

CIP Number: **232003**

Phase Category	S
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Study

Task Name	Start Date	Duration	End Date	
Scope Development				
Procurement				
Project Execution				
Project Closeout				

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			2,408	10,920	13,000				0	26,328
2019	0		0	2,408	10,920	13,000	0	0	0	26,328

Description of CIP Changes	This project may not be initiated in 2017 due to the ownership transfer. Pushed all projected expenses back one year. Did not make any changes to the existing BCE.

CIP Number: **233001**

Old CIP No.: 1357

Project Title: **Collection System Backwater Gates and Regulator Gates Rehabilitation**

Project Status Reclassified

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: SCC

Classification Lvl 3: In System Devices

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Review Committee Project Score: **46.2**

Project Significance: RECLASSIFIED BECAUSE PROJECT EXPENSES MOVED INTO NEW PROGRAM 260500. Replacement of CSO outfall back water gate is essential to prevent the river inflow into the collection system. Many are missing and the rest of them have reached their life expectancy.

Project Engineer/Manager: Mini Panicker

Manager: Biren Saparia

Scope of Work: Replacement of CSO outfall back water gate is essential to prevent the river inflow into the collection system. Many are missing and the rest of them have reached their life expectancy. X Locate the CSO Outfall back water gates, evaluate the existing conditions, and provide the necessary replacement / rehabilitation to minimize the river flow into the collection system. X The installation of these structures are dated back to 1912 under various contracts. All back water gates were replaced in the late seventies and again 6 were replaced in the recent years under PC-698. Existing ones are past their service life. X Some outfalls are below the river elevation; installation may be challenging.

Challenges: Some outfalls are below the river elevation; installation may be challenging.

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title Collection System Backwater Gates and Regulator Gates Rehabilitation

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	0	0	0	0	0	0

CIP Number: **233001**

PHASE	**Design**	Contract No	NA	Phase Status	Future Planned Start
Phase Title	Collection System Backwater Gates and Regulator Gates Rehabilitation				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

PHASE	**Study**	Contract No	NA	Phase Status	Future Planned Start
Phase Title	Collection System Backwater Gates and Regulator Gates Rehabilitation				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

Phase Tasks and Dates

Phase Category	C	**Construction**
Budget	Wastewater	
Phase Status	Future Planned Start	
Contract No	NA	
Cost Est Class		

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Phase Category	D	**Design**
Budget	Wastewater	
Phase Status	Future Planned Start	
Contract No	NA	
Cost Est Class		

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

CIP Number: **233001**

Phase Category	S
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Study

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			1,301	3,000	3,000	2,000			0	9,301
2019	0		0	0	0	0	0	0	0	0

Description of CIP Changes: Need to discuss possible combining of CIP 1393, CIP 1357 and CIP 1409

CIP Number: **233002**

Old CIP No.: 1391

Project Title: **Collection System In System Storage Devices (ISDs) Improvement**

Project Status Future Planned

Budget: Wastewater

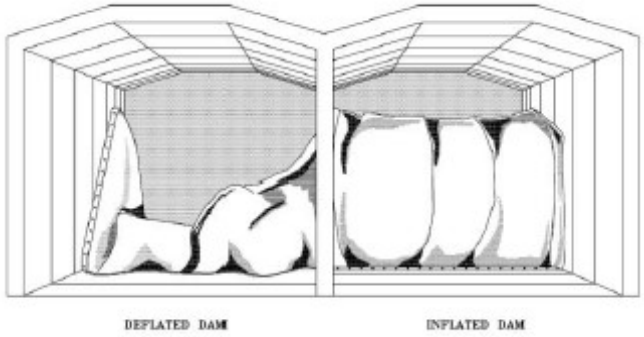
Classification Lvl 1: Wastewater

Classification Lvl 2: SCC

Classification Lvl 3: In System Devices

Review Committee Project Score: **50**

- [x] Innovation
- [ ] MP Right Sizin
- [ ] System Reliability



Inflatable dam illustration

Project Significance: ISDs are operational elements in the collection system that help in storing combined sewage during wet weather events to minimize the frequency and volume of the untreated overflows and to maximize the flows to the wastewater treatment plant and CSO control facilities.

Project Engineer/Manager: Mini Panicker

Manager: Biren Saparia

Scope of Work: Assess the existing conditions of the ISD elements and their structures and rehabilitate/ replace.

Challenges: These are operational elements, so flow control may be a challenge especially during wet weather periods.

Phase Expenses

PHASE **Construction** | Contract No NA | Phase Status Future Planned Start

Phase Title Collection System In System Storage Devices (ISDs) Improvement

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	300	2,000	1,000	0	0	0

CIP Number: **233002**

PHASE **Design** Contract No NA Phase Status Future Planned Start

Phase Title Collection System In System Storage Devices (ISDs) Improvement

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	164	0	0	0	0	0

PHASE **Study** Contract No NA Phase Status Future Planned Start

Phase Title Collection System In System Storage Devices (ISDs) Improvement

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
86	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
86	464	2,000	1,000	0	0	0

Phase Tasks and Dates

Phase Category C

Budget Wastewater

Phase Status Future Planned Start

Contract No NA

Cost Est Class

Construction

Task Name	Start Date	Duration	End Date
Scope Development	7/1/2018	30	7/31/2018
Procurement	7/31/2018	90	10/29/2018
Project Execution	10/29/2018	600	6/20/2020
Project Closeout	6/20/2020	30	7/20/2020

Phase Category D

Budget Wastewater

Phase Status Future Planned Start

Contract No NA

Cost Est Class

Design

Task Name	Start Date	Duration	End Date
Scope Development	7/1/2018	30	7/31/2018
Procurement	7/31/2018	90	10/29/2018
Project Execution	10/29/2018	600	6/20/2020
Project Closeout	6/20/2020	30	7/20/2020

CIP Number: **233002**

Phase Category	S
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Study

Task Name	Start Date	Duration	End Date
Scope Development	7/1/2018	30	7/31/2018
Procurement	7/31/2018	90	10/29/2018
Project Execution	10/29/2018	600	6/20/2020
Project Closeout	6/20/2020	30	7/20/2020

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			86	464	2,000	1,000			0	3,550
2019	0		86	464	2,000	1,000	0	0	0	3,550

Description of CIP Changes

CIP Number: 251002

Old CIP No.: 1388

Project Title: Wastewater System-Wide Instrumentation & Control Software and Hardware Upgrade

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: General Purpose

Classification Lvl 3: General Purpose

Review Committee Project Score: 70.2

- [x] Innovation
- [ ] MP Right Sizin
- [ ] System Reliability

Ovation hardware and screens

Project Significance: This Instrumentation & Controls (I&C) system upgrade is for the operating system and miscellaneous ovation hardware upgrades. It is necessary when the old OS is no longer supported by Microsoft. Ovation needs to be upgraded too.

Project Engineer/Manager: Beena Chackunkal

Manager: Ali Khraizat

Scope of Work: Upgrade Ovation software and miscellaneous hardware. An evaluation for the upgrade will be conducted. During the evaluation of the upgrade, the study will also consider an evaluation of Ovation's ultimate ability to meet GLWA's future needs.
Replace Obsolete/End of Life Allen Bradley PLC5 control systems at 3 CSO Facilities (Leib, St. Aubin, 7-Mile) and upgrade critical Instrumentation. New Controllers, HMI, network components and controls system integration.
Upgrade Ovation at 4 CSO Site(Connor, Oakwood, Baby Creek and Belle Isle) and Upgrade critical Instrumentation. Implement high performance graphics and advance alarm management and advanced process control.
Upgrade control rooms at WRRF and CSO Sites. New consoles, HVAC, Flooring, security enhancements and lighting.

Challenges: Co-ordinate with Plant and CSO operation for shutdown requests during the software and hardware upgrade.

Phase Expenses

PHASE **Study and Design and Construction Assistance** | Contract No | Phase Status Future Planned Start

Phase Title Wastewater System Wide Instrumentation & Control Software and Hardware Upgrade

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	875	515	229	114	0	0

CIP Number: **251002**

PHASE	Construction	Contract No		Phase Status	Future Planned Start
Phase Title	Wastewater System Wide Instrumentation & Control Software and Hardware Upgrade				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	2,138	6,783	3,391	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	875	2,653	7,012	3,505	0	0

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development	6/9/2019	180	12/6/2019
Procurement	12/6/2019	120	4/4/2020
Project Execution	4/5/2020	720	3/26/2022
Project Closeout	3/26/2022	60	5/25/2022

Phase Category	S/D/CA
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	6/9/2019	180	12/6/2019
Procurement	12/6/2019	120	4/4/2020
Project Execution	4/5/2020	720	3/26/2022
Project Closeout	3/26/2022	60	5/25/2022

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018						3,125	2,737		0	5,862
2019	0		0	875	2,653	7,012	3,505	0	0	14,045

Description of CIP Changes: Scope has increased per Operations requirements resulting in an increased estimated cost.

CIP Number: **260100**

Old CIP No.: 1257

Project Title: **WRRF, Lift Station and Wastewater Collection System Structures Allowance**

Project Status	Active	☐	Innovation
Budget:	Wastewater	☐	MP Right Sizin
Classification Lvl 1:	Wastewater	☐	System Reliability
Classification Lvl 2:	Programs		
Classification Lvl 3:	Programs		
Review Committee Project Score:			

Project Significance: Funding required for unplanned, emergency and critical small capital projects in the entire wastewater system

Project Engineer/Manager: Beena Chackunkal

Manager: Ali Khraizat

Scope of Work: This is an allowance for unplanned critical projects, equipment replacement/rehabilitation, critical asset replacement, energy saving projects, etc.. at the Wastewater Treatment Plant and other Wastewater Operation Facilities. Unplanned critical items include, but not limited to, mechanical, HVAC, electrical, instrumentation and control, demolition, earthwork, concrete, masonry, etc.

Challenges: N/A - Allowance

Phase Expenses

PHASE **Construction** Contract No Phase Status Closed Out

Phase Title 260103 RFP-46280 Replace 4 DS-706 Centrifuges WWTP

Phase Total

CIP Number: **260100**

PHASE	**Construction**	Contract No	SCP-PC-010	Phase Status	Closed Out
Phase Title	260105 SCP-PC-010 Tooles Contracting - Replace Various Air Distribution Equip				

Phase Total

PHASE	**Construction**	Contract No		Phase Status	Closed Out
Phase Title	260102 RFP 44380 Titus Welding Co - Replace Stairs - WRRF				

Phase Total

PHASE	**Construction**	Contract No	SCP-PC-014	Phase Status	Pending Close-out
Phase Title	260101 SCP-PC-014 Ferndale Electric Emergency Lighting				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
1,040	0	0	0	0	0	0

PHASE	**Construction**	Contract No	SCP-PC-016G	Phase Status	Pending Close-out
Phase Title	260108, Z Contractors Inc, Neff Road Pumping Station Flowmeter Replacement				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

PHASE	**Study and Design and Construction Assistance**	Contract No		Phase Status	Future Planned Start
Phase Title	Unallocated S/D/CA - WRRF, Lift Station and Wastewater Collection System Structures Allowance				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
1,145	2,290	2,290	2,290	2,290	1,145	0

PHASE	**Construction**	Contract No		Phase Status	Future Planned Start
Phase Title	Unallocated Construction - WRRF, Lift Station and Wastewater Collection System Structures Allowance				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
3,391	9,044	10,174	9,044	11,305	11,305	

CIP Number: **260100**

PHASE	**Construction**	Contract No		Phase Status	Closed Out
Phase Title	260104, RFB 46149, Installation of EB-25 Unit Substation at Incinerator Complex II, WRRF				

Phase Total

PHASE	**Construction**	Contract No		Phase Status	Pending Close-out
Phase Title	260107, Pump Station 2 Replacement				

Phase Total

PHASE	**Construction**	Contract No		Phase Status	Closed Out
Phase Title	260109, RFB-46533, Weiss Construction, Rehab Valve Remote Flow Control Facility				

Phase Total

PHASE	**Construction**	Contract No	SCP-PC-015	Phase Status	Future Planned Start
Phase Title	260111, SCP-PC-015, W-3 Construction, Overhead Door				

Phase Total

PHASE	**Construction**	Contract No	DWS-065	Phase Status	Pending Close-out
Phase Title	260112, Tooles, Connor Creek CSO Control Facility Access Hatches				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
55						

PHASE	**Construction**	Contract No		Phase Status	Active
Phase Title	260113, Walsh Construction, WRRF Fire Remediation				

Phase Total

CIP Number: **260100**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
5,631	11,334	12,464	11,334	13,595	12,450	0

Phase Tasks and Dates

Phase Category	C	**Construction**
Budget	Wastewater	
Phase Status	Active	
Contract No		
Cost Est Class		

Phase Category	C	**Construction**
Budget	Wastewater	
Phase Status	Pending Close-out	
Contract No	DWS-065	
Cost Est Class		

Phase Category	C	**Construction**
Budget	Wastewater	
Phase Status	Future Planned Start	
Contract No	SCP-PC-015	
Cost Est Class		

CIP Number: **260100**

Phase Category	C	**Construction**
Budget	Wastewater	
Phase Status	Closed Out	
Contract No		
Cost Est Class		

Phase Category	C	**Construction**
Budget	Wastewater	
Phase Status	Pending Close-out	
Contract No		
Cost Est Class		

Phase Category	C	**Construction**
Budget	Wastewater	
Phase Status	Closed Out	
Contract No		
Cost Est Class		

Phase Category	C	**Construction**
Budget	Wastewater	
Phase Status	Future Planned Start	
Contract No		
Cost Est Class		

CIP Number: **260100**

Phase Category	C	**Construction**
Budget	Wastewater	
Phase Status	Pending Close-out	
Contract No	SCP-PC-016G	
Cost Est Class		

Phase Category	C	**Construction**
Budget	Wastewater	
Phase Status	Pending Close-out	
Contract No	SCP-PC-014	
Cost Est Class		

Phase Category	C	**Construction**
Budget	Wastewater	
Phase Status	Closed Out	
Contract No		
Cost Est Class		

Phase Category	C	**Construction**
Budget	Wastewater	
Phase Status	Closed Out	
Contract No	SCP-PC-010	
Cost Est Class		

CIP Number: **260100**

Phase Category	C	**Construction**
Budget	Wastewater	
Phase Status	Closed Out	
Contract No		
Cost Est Class		

Phase Category	S/D/CA	**Study and Design and Construction Assistance**
Budget	Wastewater	
Phase Status	Future Planned Start	
Contract No		
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		5,587	12,000	12,000	15,000	15,000	12,000		0	71,587
2019	2,024	12,734	5,631	11,334	12,464	11,334	13,595	12,450	0	81,566

Description of CIP Changes

CIP Number: **260200**

Old CIP No.: 1263

Project Title: **Sewer and Interceptor Evaluation and Rehabilitation Program**

Project Status Active

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

An example interceptor

Project Significance: Evaluation of the existing condition of the sewers and interceptors, cleaning and rehabilitating are essential to optimize the transportation capacity of the GLWA collection system and to increase its life expectancy.

Project Engineer/Manager: Mini Panicker

Manager: Biren Saparia

Scope of Work: Provide CCTV and or sonar inspection of the GLWA Collection System Interceptors and Trunk Sewers to reveal the existing conditions as per the National Association of Sewer Service Companies' (NASSCO) Pipeline Assessment Certification Program (PACP) standards, evaluate the existing conditions, and provide the necessary cleaning/rehabilitation/replace to optimize the design capacity of the collection system and to minimize the inflow and infiltration into the collection system.

Challenges: Large sewers and interceptors may have flow control challenges for both inspection and rehabilitation.

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No CS-168 Phase Status Active

Phase Title CS-168, FK Engineering, Sewer and Interceptor Evaluation and Rehabilitation Program

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	1,139	1,121	1,087	0	0	0	0

CIP Number: **260200**

PHASE	Construction	Contract No	CS-068	Phase Status	Pending Close-out
Phase Title	CS-068, Sewer and Interceptor Evaluation and Rehabilitation Program				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
1,344	0	0	0	0	0	0

PHASE	Study and Design and Construction Assistance	Contract No	PO-005030	Phase Status	Pending Close-out
Phase Title	PO-005030, Sewer and Interceptor Evaluation and Rehabilitation Program				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
164	0	0	0	0	0	0

PHASE	Construction	Contract No	NA	Phase Status	Future Planned Start
Phase Title	UNALLOCATED, Sewer and Interceptor Evaluation and Rehabilitation Program				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	20,000	20,000	17,058	0	

PHASE	Study and Design and Construction	Contract No	CON-149	Phase Status	Active
Phase Title	CON-149, Conner Creek PLC Upgrades				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
7,400	7,400					

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
10,047	8,521	21,087	20,000	17,058	0	0

Phase Tasks and Dates

Phase Category	C	**Construction**
Budget	Wastewater	
Phase Status	Future Planned Start	
Contract No	NA	
Cost Est Class		

CIP Number: **260200**

Phase Category	C	**Construction**
Budget	Wastewater	
Phase Status	Pending Close-out	
Contract No	CS-068	
Cost Est Class		

Phase Category	S/D/C	**Study and Design and Construction**
Budget	Wastewater	
Phase Status	Active	
Contract No	CON-149	
Cost Est Class		

Phase Category	S/D/CA	**Study and Design and Construction Assistance**
Budget	Wastewater	
Phase Status	Pending Close-out	
Contract No	PO-005030	
Cost Est Class		

Phase Category	S/D/CA	**Study and Design and Construction Assistance**
Budget	Wastewater	
Phase Status	Active	
Contract No	CS-168	
Cost Est Class		

CIP Number: **260200**

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		2,612	8,000	8,000	20,000	20,000	20,000		0	78,612
2019	0	3,397	10,047	8,521	21,087	20,000	17,058	0	0	80,110

Description of CIP Changes	Prioritization codes were missing, so they were added. Continued program into 2023. Added $23M.

CIP Number: 260300

Old CIP No.: 1330

Project Title: Scheduled Replacement Program of Critical Assets

Project Status	Active	☐	Innovation
Budget:	Wastewater	☐	MP Right Sizin
Classification Lvl 1:	Wastewater	☐	System Reliability
Classification Lvl 2:	Programs		
Classification Lvl 3:	Programs		
Review Committee Project Score:			

Aerial view of the WRRF

Project Significance: This program is to perform the scheduled replacement for critical assets and planned small capital projects (SCP) at WRRF and WW operations

Project Engineer/Manager: Beena Chackunkal

Manager: Ali Khraizat

Scope of Work: SRP implementation procedures includes replacement for key Equipment and facilities, prepare long- range replacement schedules, yearly budget Estimates, O & M annual costs, Equipment Replacement Criteria and conclusions and recommendations.

Challenges: Depending on type of project, long term or short term projects equipment or part of process areas need to shut down.

Phase Expenses

PHASE **Construction** Contract No CON-143 Phase Status Pending Close-out

Phase Title CON-143, Roof Replacement of Complex II

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,011	0	0	0	0	0	0

PHASE **Study and Design and Construction Assistance** Contract No Phase Status Future Planned Start

Phase Title UNALLOCATED: Scheduled Replacement Program of Critical Assets

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
114	572	572	572	572	572	0

CIP Number: **260300**

PHASE	Construction	Contract No		Phase Status	Future Planned Start
Phase Title	UNALLOCATED: Scheduled Replacement Program of Critical Assets				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
565	5,652	5,652	5,652	5,652	5,652	0

PHASE	Construction	Contract No	SCP-CON-127	Phase Status	Active
Phase Title	SCP-CON-127, Lakeshore, Decommissioning of Existing Watermain and Ductwork Rehabilitation at WRRF				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
161	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,851	6,224	6,224	6,224	6,224	6,224	0

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Active
Contract No	SCP-CON-127
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	6/5/2017	140	10/23/2017
Project Closeout	10/23/2017	60	12/22/2017

Phase Category	C
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	6/5/2017	140	10/23/2017
Project Closeout	10/23/2017	60	12/22/2017

CIP Number: **260300**

Phase Category	C
Budget	Wastewater
Phase Status	Pending Close-out
Contract No	CON-143
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	6/5/2017	140	10/23/2017
Project Closeout	10/23/2017	60	12/22/2017

Phase Category	S/D/CA
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution	6/5/2017	140	10/23/2017
Project Closeout	10/23/2017	60	12/22/2017

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		500	5,000	5,000	5,000	5,000	5,000		0	25,500
2019	0	56	2,851	6,224	6,224	6,224	6,224	6,224	0	34,027

Description of CIP Changes

CIP Number: 260400

Old CIP No.: 1344

Project Title: Sewage Meter Design, Installation, Replacement and Rehabilitation Program

Project Status Active

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Example of a flow meter

Project Significance: Improving meter data reliability, ensuring accurate billing, improving customer service and allow high quality analysis of the system

Project Engineer/Manager: Chandan Sood

Manager: Chandan Sood

Scope of Work: Replace the existing antiquated metering equipment with new metering equipment.

Challenges: Requires temporary shutdown of large sewers

Phase Expenses

PHASE **Study and Design and Construction** Contract No CON-179 Phase Status Active

Phase Title Sewage Meter Design, Installation, Replacement and Rehabilitation Program

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
500	1,700	1,700	1,700	1,000	1,000	1,000

PHASE **Design and Construction** Contract No Phase Status Active

Phase Title Unallocated Sewage Meter Design, Installation, Replacement and Rehabilitation Program

Phase Total

CIP Number: **260400**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
500	1,700	1,700	1,700	1,000	1,000	1,000

Phase Tasks and Dates

Phase Category	D/C	**Design and Construction**
Budget	Wastewater	
Phase Status	Active	
Contract No		
Cost Est Class		

Phase Category	S/D/C	**Study and Design and Construction**
Budget	Wastewater	
Phase Status	Active	
Contract No	CON-179	
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		500	500	500	500	500	500		0	3,000
2019	0		500	1,700	1,700	1,700	1,000	1,000	1,000	8,600

Description of CIP Changes

CIP Number: **260500**

Old CIP No.: 1409

Project Title: **CSO Outfall Rehabilitation**

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: SCC

Classification Lvl 3: Interceptors

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Review Committee Project Score: **72.8**

Sewer tap piping in B009 outfall (left) and sludge buildup and poor masonry in B007 outfall (right)

Project Significance: PROJECTS 222005, 222006 AND 233001 HAVE BEEN INCORPORATED INTO THIS PROJECT. Rehabilitation of the CSO outfalls is essential to properly discharge the uncontrollable combined sewer overflows to the receiving waters and to prevent sewer back up into the Conveyance System. Recent inspections of the outfalls revealed structural deficiencies like fractures, missing mortar from bricks etc. There are sediment and debris deposits in many of them.

Project Engineer/Manager: Mini Panicker

Manager: Biren Saparia

Scope of Work: Preliminary Scope of Work of the project is construction. Contract CS-168 will review the existing records, evaluate the existing conditions, and provide the necessary design to rehabilitate the outfalls.

Challenges: Some outfalls are below the river elevation; rehabilitation may be challenging.

Phase Expenses

PHASE **Construction** Contract No NA Phase Status Future Planned Start

Phase Title Collection System Backwater Gates and Regulator Gates Rehabilitation

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	1,301	3,000	3,000	2,000			

CIP Number: **260500**

PHASE	Construction	Contract No	NA	Phase Status	Future Planned Start
Phase Title	Unallocated General CSO Outfall Rehabilitation				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
3,000	7,000	7,000	7,000	6,000	6,000	0

PHASE	Construction	Contract No	NA	Phase Status	Future Planned Start
Phase Title	Collection System CSO Access Hatch Improvements				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
3,196	2,000	2,001				

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
7,497	12,000	12,001	9,000	6,000	6,000	0

Phase Tasks and Dates

Phase Category	C	Construction
Budget	Wastewater	
Phase Status	Future Planned Start	
Contract No	NA	
Cost Est Class		

Phase Category	C	Construction
Budget	Wastewater	
Phase Status	Future Planned Start	
Contract No	NA	
Cost Est Class		

CIP Number: **260500**

Phase Category	C	**Construction**
Budget	Wastewater	
Phase Status	Future Planned Start	
Contract No	NA	
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			6,000	6,000	6,000	6,000	6,000	6,000	0	36,000
2019	0		7,497	12,000	12,001	9,000	6,000	6,000	0	52,498

Description of CIP Changes	Previous projected expenses from the 2018-2022 CIP for project 222006 are already included in the 2018 values below. An additional $7,197 was moved from CIP 222005 into this program and $9,301 moved from CIP 233001 into this ongoing program. This accounts for the perceived increase of $16,498. In summary, all three projects (222005, 222006 & 233001) are now included in the Program and projected expenditures have remained the same.

CIP Number: 260600

Old CIP No.: 1384

Project Title: CSO FACILITIES IMPROVEMENT PROGRAM

Project Status Active

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: WRRF

Classification Lvl 3: CSO RTB & SDF

Review Committee Project Score: 90.6

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Retrofitted chemical feed pump replacement at Puritan-Fenkell RTB and makeshift wooden stairs to enter Basin Valve Gallery

Project Significance: This program is being established to facilitate the study, design, construction administration, and construction of improvements necessary to maintain the facilities which contribute to the CSO Control Program and compliance herewith.

Project Engineer/Manager: Chris Nastally

Manager: Chris Nastally

Scope of Work: This program is intended to include studies, design, construction administration, and construction projects which serve to improve process areas or functions of the CSO Facilities. The overall scope of this program is to facilitate improvements to the disinfection systems, screening systems, facility automation, safety systems, flushing systems, instrumentation & controls, electrical systems, various buildings systems (HVAC, lighting, etc.), and other miscellaneous improvements identified at the facilities throughout the life of this program. The primary drivers of these improvements will be obsolescence/end of service life, excessive O&M problems, reliability, efficiency and system standardization which arise from feedback from operation & maintenance, the scheduled replacement plan, and the needs assessment.

Challenges: As this program starts off, there is a lot of design RFPs in the beginning which will lead to large scale construction projects in the later years (3-5). A significant challenge to be faced will be maintaining the CSO facilities in current operations without the benefit of large-scale improverments of the CSO Systems. Another significant challenge of this program will be unforseen conditions that may

Phase Expenses

PHASE **Design and Construction** Contract No Phase Status Future Planned Start

Phase Title TBD - UNALLOCATED S/D/CA/C

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	5,017	5,435	14,962	27,062	17,562	2,562

CIP Number: **260600**

PHASE	Construction	Contract No	CON-144	Phase Status	Pending Close-out
Phase Title	CON-144 - Rehabilitation of CSO RTB's				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
724	0	0	0	0	0	0

PHASE	Study and Design and Construction Assistance	Contract No	CS-145	Phase Status	Pending Close-out
Phase Title	CS-145 - S/D/Ca for Improvements to the CSO RTB's				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
137	0	0	0	0	0	0

PHASE	Construction	Contract No	DWS-065	Phase Status	Pending Close-out
Phase Title	DWS-065 - Rehabilitation of CSO RTB's (Replaces CIP1313)				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

PHASE	Design	Contract No	CS-172	Phase Status	Pending Close-out
Phase Title	CS-172 - Conner Creek CSO RTB Automation Improvements				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
114	0	0	0	0	0	0

PHASE	Design	Contract No	CS-116	Phase Status	Active
Phase Title	CS-116 - Rehabilitation of Conner Creek CSO RTB Effluent Launder Gates & Emergency Relief Gates				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
114	102	48	0	0	0	0

PHASE	Construction	Contract No	CON-234	Phase Status	Future Planned Start
Phase Title	CON-234 (No may change) - Conner Creek CSO RTB Construction of Automation Improvements and Basin Effluent Gate Improvements (CS-				

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
565	6,717	1,217				

CIP Number: **260600**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
1,654	11,836	6,700	14,962	27,062	17,562	2,562

Phase Tasks and Dates

Phase Category	C
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	CON-234
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Project Execution	3/1/2018	540	8/23/2019
Project Closeout	8/23/2019	60	10/22/2019

Phase Category	C
Budget	Wastewater
Phase Status	Pending Close-out
Contract No	DWS-065
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Project Execution	3/1/2018	540	8/23/2019
Project Closeout	8/23/2019	60	10/22/2019

Phase Category	C
Budget	Wastewater
Phase Status	Pending Close-out
Contract No	CON-144
Cost Est Class	

Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Project Execution	3/1/2018	540	8/23/2019
Project Closeout	8/23/2019	60	10/22/2019

CIP Number: **260600**

Phase Category	D
Budget	Wastewater
Phase Status	Active
Contract No	CS-116
Cost Est Class	

Design

Task Name	Start Date	Duration	End Date
Scope Development			
Project Execution	3/1/2018	540	8/23/2019
Project Closeout	8/23/2019	60	10/22/2019

Phase Category	D
Budget	Wastewater
Phase Status	Pending Close-out
Contract No	CS-172
Cost Est Class	

Design

Task Name	Start Date	Duration	End Date
Scope Development			
Project Execution	3/1/2018	540	8/23/2019
Project Closeout	8/23/2019	60	10/22/2019

Phase Category	D/C
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	
Cost Est Class	

Design and Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Project Execution	3/1/2018	540	8/23/2019
Project Closeout	8/23/2019	60	10/22/2019

Phase Category	S/D/CA
Budget	Wastewater
Phase Status	Pending Close-out
Contract No	CS-145
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development			
Project Execution	3/1/2018	540	8/23/2019
Project Closeout	8/23/2019	60	10/22/2019

CIP Number: **260600**

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		3,520	2,247	6,400	9,000	7,200	3,610		0	31,977
2019	0	764	1,654	11,836	6,700	14,962	27,062	17,562	2,562	83,102

Description of CIP Changes	Costs for FY 2019 construction have increased due to the emergency nature of the required projects at the Conner Creek CSO Facility and to facilitate design and construction of new alarm systems for 7 of the CSO Facilities (excepting Conner & Oakwood - minor repairs) because those systems are not functional at this time. There are costs for FY 19/20 for construction in the program that are placeholders in case any of the inspection programs under maintenance find issues with the facilities which are emergency in nature and require repair immediately. Furthermore, the costs from the 2018 CIP to the 2019 CIP have increased significantly, primarily in Fiscal Years 21,22,23, and 24 & Beyond. The primary reason for this is the items previously identified in the CIP were not laid out and grouped as projects to determine total project cost and lay out the projected completion of these projects from design-phase to construction-phase. Beginning in FY 18, a significant effort is anticipated by the emerging CSO Control Program Group to develop several RFPs seeking design-phase consulting assistance to complete the identified projects from the Needs Assessment, Scheduled Replacement Plan, and those identified by Operations/Maintenance as equipment which requires significant effort to maintain & operate or has failed. The RFPs and resulting design work are anticipated to ramp up heavily in FY20 with the fruits of those designs (construction projects) beginning construction in FY 21 and continuing through FY 23. Beyond FY 23 is a budgeted amount which will most likely change over the next fiscal year or two as more information is obtained in assessing the CSO Facilities condition and as efforts from the Wastewater Master Plan may affect the overall direction of the program. This same goes for the identified design (consulting) efforts which are presently shown to tail off in FY 22. As more projects become identified and prioritized, the design efforts for FY 22 and beyond will likely require adjustment under this program, or possibly could justify their own CIP project number and means of individual tracking.

SECTION 3 CENTRALIZED SERVICES

CIP Number: **331001**

Old CIP No.: 1279

Project Title: **Roofing Systems Replacement at Water Plants and Booster Pump Stations**

Project Status Future Planned

Budget: Water

Classification Lvl 1: Centralized Services

Classification Lvl 2: Facilities

Classification Lvl 3: General Purpose

Review Committee Project Score: **61**

- [x] Innovation
- [ ] MP Right Sizin
- [ ] System Reliability

Roof in need of repair

Project Significance: This CIP provides funds to replace roofing systems that are past their useful service life and thus too costly to repair. Sound roofing systems are important to protect the process infrastructure inside GLWA's buildings.

Project Engineer/Manager: Paula Anderson

Manager: Paula Anderson

Scope of Work: This project encompasses the evaluation of all Water Treatment Plant and Booster Pump Station roofs to determine their current condition and to prioritize their repair or replacement. The project will evaluate the type of roof, built-up roofing material, flashing, roof drains/conductors and sealing materials that comprise the building envelope. The findings of the roof survey and evaluation will be used to prioritize roof repair and replacement projects for design and construction.

Challenges: Weather dependent and seasonal work. May require management of several construction projects simultaneously to complete the work. The project should include but, not be limited to the following, material testing for hazardous materials, thermal scans and condition analysis.

Phase Expenses

PHASE **Study and Design and Construction** Contract No NA Phase Status Future Planned Start

Phase Title Roofing Systems Replacement at Water Plants and Booster Pump Stations

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	3,064	2,064	2,064	0	0	0	0

CIP Number: **331001**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
3,064	2,064	2,064	0	0	0	0

Phase Tasks and Dates

Phase Category	S/D/C
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Study and Design and Construction

Task Name	Start Date	Duration	End Date
Scope Development	1/1/2018	100	4/11/2018
Procurement	4/11/2018	220	11/17/2018
Project Execution	11/11/2017	1000	8/7/2020
Project Closeout	8/7/2020	90	11/5/2020

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		3,000	3,000	3,000	2,500				0	11,500
2019	0		3,064	2,064	2,064	0	0	0	0	7,192

Description of CIP Changes

CIP Number: **331002**

Old CIP No.: 1387

Project Title: **Roofing Systems Replacement at GLWA WRRF, CSO Retention Treatment Basins (RTB) and Screening Disinfection Facilities (SDF)**

Project Status Future Planned

Budget: Wastewater

Classification Lvl 1: Wastewater

Classification Lvl 2: Programs

Classification Lvl 3: General Purpose

Review Committee Project Score: **43.8**

- [x] Innovation
- [ ] MP Right Sizin
- [ ] System Reliability

Photo of Complex – I Dewatering Roof at the WRRF. Complex – II Incinerator ($1.8M) and Complex – II Dewatering ($1.0 M) replacement are under consideration to be part of fire remediation project

Project Significance: Some of the roofs at GLWA WRRF facilities are near its end of useful life. The roofs help to protect the expensive equipment by preventing rain water entering through roofs into the facilities.

Project Engineer/Manager: Ali Khraizat

Manager: Ali Khraizat

Scope of Work: Inspect the roofing system conditions and assess drainage conditions on all the GLWA wastewater related facility buildings. Document the roofing systems inspections by taking and submitting high-quality photographs, scaled drawings, sketches, and inspection notes to adequately describe the conditions and deficiencies of the roofing systems and their drainage facilities. Recommend the extent of the roofing repairs and replacements required. Document the roof for each building inspected on the project. Classify the roofs into three (3) main categories, such as, 1) Roofs that require complete replacement, 2) Roofs that only require repair, and 3) Roofs that require no action within the next 10 years. Develop a recommended implementation/planning schedule with budgetary costs tied to the schedule for roofing system repairs and replacements that GLWA should plan for over the next 10 years. Provide preventative care suggestions for the GLWA's roofing systems evaluated under this contract. Provide any OSHA compliance suggestions that may be applicable for the GLWA's roofing systems evaluated under this contract.

Challenges: Roof material testing for asbestos before demolition and flashing will be challenge to manage as low levels of asbestos are very common in the GLWA's old roof type systems.

CIP Number: **331002**

Phase Expenses

PHASE **Construction** | Contract No NA | Phase Status Future Planned Start

Phase Title Roofing Systems Replacement at GLWA Wastewater Treatment Plant CSO Retention Treatment Basins (RTB) and Screening Disinfection Fac

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	652	5,460	5,000	0	0

PHASE **Study and Design and Construction Assistance** | Contract No NA | Phase Status Future Planned Start

Phase Title Roofing Systems Replacement at GLWA Wastewater Treatment Plant CSO Retention Treatment Basins (RTB) and Screening Disinfection Fac

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	286	57	114	114	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	286	709	5,574	5,114	0	0

Phase Tasks and Dates

Phase Category C

Budget Wastewater

Phase Status Future Planned Start

Contract No NA

Cost Est Class

Construction

Task Name	Start Date	Duration	End Date
Scope Development	12/5/2019	90	3/4/2020
Procurement	3/4/2020	120	7/2/2020
Project Execution	7/3/2020	720	6/23/2022
Project Closeout	6/23/2022	60	8/22/2022

Phase Category S/D/CA

Budget Wastewater

Phase Status Future Planned Start

Contract No NA

Cost Est Class

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	12/5/2019	90	3/4/2020
Procurement	3/4/2020	120	7/2/2020
Project Execution	7/3/2020	720	6/23/2022
Project Closeout	6/23/2022	60	8/22/2022

CIP Number: **331002**

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			2,200	2,060	1,060	1,050	540	2,140	0	9,050
2019	0		0	286	709	5,574	5,114	0	0	11,683

Description of CIP Changes	Estimated cost changed.

CIP Number: **351001**

Old CIP No.: 1366

Project Title: **Water Facility Lighting Renovations**

Project Status Active

Budget: Water

Classification Lvl 1: Centralized Services

Classification Lvl 2: Energy Management

Classification Lvl 3: General Purpose

Review Committee Project Score: **60.8**

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Example LED light fixture

Project Significance: Energy savings, demand reduction improved visibility, safety, operational efficiency and worker productivity

Project Engineer/Manager: Shaker Manns

Manager: Shaker Manns

Scope of Work: Remove identified old fixtures and replace with new LED lamps and advanced control systems.

Challenges: Some outfalls are below the river elevation; installation may be challenging.

Phase Expenses

PHASE **Design and Build** Contract No NA Phase Status Active

Phase Title Water Facility Lighting Renovations

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,774	0	0	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
2,774	0	0	0	0	0	0

CIP Number: **351001**

Phase Tasks and Dates

Phase Category	DB
Budget	Water
Phase Status	Active
Contract No	NA
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development	5/21/2017	40	6/30/2017
Procurement	8/8/2017	150	1/5/2018
Project Execution	1/5/2018		
Project Closeout			

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018			933	933	933				0	2,799
2019	0		2,774	0	0	0	0	0	0	2,774

Description of CIP Changes

CIP Number: 361001

Old CIP No.: 1153

Project Title: Consolidated Process Control System Upgrades

Project Status Pending Closeout

Budget: Split

Classification Lvl 1: Centralized Services

Classification Lvl 2: Engineering

Classification Lvl 3: General Purpose

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

A system control room

Project Significance: Provide reliability, redundancy and improved functionality to department-wide Process Control System.

Project Engineer/Manager: Biren Saparia

Manager: Biren Saparia

Scope of Work: This project involves integrating the control and monitoring network throughout all of the facilities with the new SCADA system installed under PC-713. The work includes control system hardware, software, and firmware upgrade or replacement, troubleshooting, installation, start-up, testing, and repair services.

Challenges: N/A - Pending Closeout

Phase Expenses

PHASE **Design and Build** Contract No PC-773C Phase Status Pending Close-out

Phase Title Consolidated Process Control System Upgrades

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	0	0	0	0	0	0

PHASE **Design and Build** Contract No PC-773D Phase Status Pending Close-out

Phase Title Consolidated Process Control System Upgrades

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	0	0	0	0	0	0

CIP Number: **361001**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

Phase Tasks and Dates

Phase Category	DB
Budget	Wastewater
Phase Status	Pending Close-out
Contract No	PC-773D
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Phase Category	DB
Budget	Water
Phase Status	Pending Close-out
Contract No	PC-773C
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	3,928	640							0	4,568
2019	406	236	0	0	0	0	0	0	0	642

Description of CIP Changes: This project is pending close-out. Did not make any changes.

CIP Number: **361002**

Old CIP No.: 1206

Project Title: **Data Center Reliability/Availability Improvements**

Project Status Pending Closeout

Budget: Split

Classification Lvl 1: Centralized Services

Classification Lvl 2: Engineering

Classification Lvl 3: General Purpose

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Review Committee Project Score:

Project Significance: N/A - Pending Closeout

Project Engineer/Manager: Biren Saparia

Manager: Biren Saparia

Scope of Work: N/A - Pending Closeout

Challenges: N/A - Pending Closeout

Phase Expenses

PHASE **Design and Build** Contract No DWS-881 Phase Status Pending Close-out

Phase Title Data Center Reliability/Availability Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

PHASE **Design and Build** Contract No DWS-881 Phase Status Pending Close-out

Phase Title Data Center Reliability/Availability Improvements

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

CIP Number: **361002**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

Phase Tasks and Dates

Phase Category	DB
Budget	Wastewater
Phase Status	Pending Close-out
Contract No	DWS-881
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Phase Category	DB
Budget	Water
Phase Status	Pending Close-out
Contract No	DWS-881
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	6,003	10							0	6,013
2019	33		0	0	0	0	0	0	0	33

Description of CIP Changes

CIP Number: **361003**

Old CIP No.: 1207

Project Title: **SCADA Radio Network Upgrade**

Project Status Pending Closeout

Budget: Split

Classification Lvl 1: Centralized Services

Classification Lvl 2: Engineering

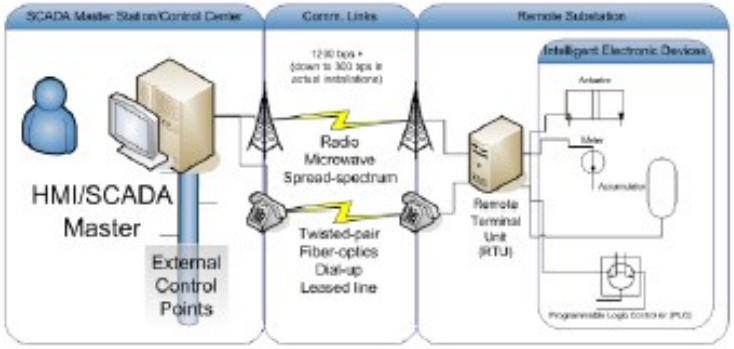
Classification Lvl 3: General Purpose

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability



Project Significance: N/A - Pending Closeout

Project Engineer/Manager: Biren Saparia

Manager: Biren Saparia

Scope of Work: N/A - Pending Closeout

Challenges: N/A - Pending Closeout

Phase Expenses

PHASE **Design and Build** Contract No DWS-882 Phase Status Pending Close-out

Phase Title SCADA Radio Network Upgrade

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

PHASE **Design and Build** Contract No DWS-882 Phase Status Pending Close-out

Phase Title SCADA Radio Network Upgrade

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

CIP Number: **361003**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

Phase Tasks and Dates

Phase Category	DB
Budget	Wastewater
Phase Status	Pending Close-out
Contract No	DWS-882
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Phase Category	DB
Budget	Water
Phase Status	Pending Close-out
Contract No	DWS-882
Cost Est Class	

Design and Build

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	6,221	218							0	6,439
2019	2,456	904	0	0	0	0	0	0	0	3,360

Description of CIP Changes

CIP Number: **380400**

Old CIP No.: 956

Project Title: **As-needed CIP Implementation Assistance and Related Services**

Project Status Active

Budget: Split

Classification Lvl 1: Centralized Services

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Make a Plan

Project Significance: The purpose of this proposed contract is to provide implementation assistance and related services on a task order basis to support the GLWA. The services provided under this contract include assistance in capital projects definition and planning, design and construction phase procurement assistance and monitoring; third party contract administration/oversight assistance/scheduling services; claims/changes analysis and resolution; technical training; value engineering (VE) services on selected design projects; develop engineering study reports; identify minimum requirements, scope of work, basis of process design, performance criteria, minimum standards of quality, and preliminary design and oversight services for design/build contracts; proposal analysis assistance; engineering forensic analysis, and additional program support services.

Project Engineer/Manager: Gaylor Johnson / Dan Edwards

Manager: Ali Khraizat

Scope of Work: This project provides for multi-discipline Engineering services on an "as-needed basis" to support GLWA's Water & Sewer Systems. The purpose of this proposed contract is to provide implementation assistance and related services on a task order basis to support the GLWA. The services provided under this contract include assistance in capital projects definition and planning, design and construction phase procurement assistance and monitoring; third party contract administration/oversight assistance/scheduling services; claims/changes analysis and resolution; technical training; value engineering (VE) services on selected design projects; develop engineering study reports; identify minimum requirements, scope of work, basis of process design, performance criteria, minimum standards of quality, and preliminary design and oversight services for design/build contracts; proposal analysis assistance; engineering forensic analysis, and additional program support services.

Challenges: N/A - Active

CIP Number: **380400**

Phase Expenses

PHASE **Study and Design and Construction Assistance** | Contract No 166 | Phase Status Under Procurement

Phase Title Capital Improvement Program (CIP) Implementation Assistance and Related Services (CS-166)

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
250	803	803	803			

PHASE **Study and Design and Construction Management** | Contract No CS-1433 | Phase Status Closed Out

Phase Title As-needed CIP Implementation Assistance and Related Services

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

PHASE **Study and Design and Construction Assistance** | Contract No 166 | Phase Status Under Procurement

Phase Title Capital Improvement Program (CIP) Implementation Assistance and Related Services (CS-166)

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
250	803	803	803			

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
500	1,606	1,606	1,606	0	0	0

Phase Tasks and Dates

Phase Category S/D/CA **Study and Design and Construction Assistance**

Budget Water

Phase Status Under Procurement

Contract No 166

Cost Est Class

CIP Number: **380400**

Phase Category	S/D/CA	**Study and Design and Construction Assistance**
Budget	Wastewater	
Phase Status	Under Procurement	
Contract No	166	
Cost Est Class		

Phase Category	S/D/CM	**Study and Design and Construction Management**
Budget	Wastewater	
Phase Status	Closed Out	
Contract No	CS-1433	
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	4,770	1,400	100						0	6,270
2019	210		500	1,606	1,606	1,606	0	0	0	5,528

Description of CIP Changes

CIP Number: 380500

Old CIP No.: 1026

Project Title: Wastewater General Engineering Services on an As-needed Basis

Project Status Active

Budget: Split

Classification Lvl 1: Centralized Services

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Example of pipe being laid

Project Significance: Various engineering as needed services for design and replacement of aging water and sewer lines.

Project Engineer/Manager: Beena Chackunkal

Manager: Ali Khraizat

Scope of Work: This project involves designing water main and lateral sewer replacement projects for aging and dysfunctional water mains and sewers throughout the system and several projects at the WRRF under different tasks on an as-needed basis. The work also includes civil, structural, architectural, hydraulics, mechanical, electrical, surveying, instrumentation and piping design services.

Challenges:

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No CS-1499 Phase Status Active

Phase Title Wastewater General Engineering Services on an As-needed Basis (CS-1499 METCO)

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
114	114	91	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
114	114	91	0	0	0	0

CIP Number: **380500**

Phase Tasks and Dates

Phase Category	S/D/CA
Budget	Wastewater
Phase Status	Active
Contract No	CS-1499
Cost Est Class	

Study and Design and Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	10,065	228	228						0	10,521
2019	282		114	114	91	0	0	0	0	601

Description of CIP Changes

CIP Number: 380600

Old CIP No.: 1031

Project Title: As-Needed General Engineering Services

Project Status Active

Budget: Split

Classification Lvl 1: Water

Classification Lvl 2: WRRF

Classification Lvl 3: Programs

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Project Significance: Allowance for the study and design of critical projects throughout the system prior to bidding and construction.

Project Engineer/Manager: Grant Gartrell

Manager: Grant Gartrell

Scope of Work: As-needed engineering services for water and wastewater engineering.

Challenges: N/A - Active

Phase Expenses

PHASE **Design** Contract No CS-1432A Phase Status Active

Phase Title CS-1432A Water As-Needed Engineering Services

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
236	276	0	0	0	0	0

PHASE **Design** Contract No CS-1432A Phase Status Active

Phase Title CS-1432A Wastewater As-Needed Engineering Services

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
170	51	50				

CIP Number: **380600**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
406	327	50	0	0	0	0

Phase Tasks and Dates

Phase Category	D	**Design**
Budget	Wastewater	
Phase Status	Active	
Contract No	CS-1432A	
Cost Est Class		

Phase Category	D	**Design**
Budget	Water	
Phase Status	Active	
Contract No	CS-1432A	
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	14,011	446	436	386					0	15,279
2019	316		406	327	50	0	0	0	0	1,099

Description of CIP Changes: Updated to reflect budget remaining. Added GLWA costs.

CIP Number: 380700

Old CIP No.: 1147

Project Title: As-Needed Geotechnical and Related Engineering Services

Project Status Active

Budget: Water

Classification Lvl 1: Water

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Example of testing being performed

Project Significance: Design of Telegraph Rd, Wick Rd, Park-Merriman, & Schoolcraft water main projects.

Project Engineer/Manager: Eric Kramp

Manager: Grant Gartrell

Scope of Work: Project utilized as the design mechanism for the Telegraph Road, Wick Road, Park-Merriman, and Schoolcraft water main projects. Also, contract has provisions for the as-needed services associated with pipeline construction projects such as testing, staking, and inspection.

Challenges: N/A - Active

Phase Expenses

PHASE **Design & Construction Assistance** Contract No CS-1488 Phase Status Active

Phase Title Engineering Services, Concrete Testing and Soil Borings (CS-1488)

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
563	563	563	563	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
563	563	563	563	0	0	0

CIP Number: **380700**

Phase Tasks and Dates

Phase Category	D/CA
Budget	Water
Phase Status	Active
Contract No	CS-1488
Cost Est Class	

Design & Construction Assistance

Task Name	Start Date	Duration	End Date
Scope Development	1/1/2005	365	1/1/2006
Procurement	1/1/2006	365	1/1/2007
Project Execution	1/1/2007	5211	4/8/2021
Project Closeout	4/8/2021	365	4/8/2022

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		650	907	333	333	333			0	2,557
2019	230		563	563	563	563	0	0	0	2,482

Description of CIP Changes

CIP Number: **380800**

Old CIP No.: 1164

Project Title: **Geotechnical and Related Services on an As-Needed Basis**

Project Status Pending Closeout

Budget: Split

Classification Lvl 1: Centralized Services

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Example of a pipe being laid

Project Significance: As Needed geotechnical consulting services.

Project Engineer/Manager: Grant Gartrell

Manager: Grant Gartrell

Scope of Work: The work includes consultant services for geotechnical work on as-needed basis. The work also provides for additional engineering/ technical services as requested.

Challenges: N/A - Pending Closeout

Phase Expenses

PHASE **Design** Contract No CS-1490 Phase Status Pending Close-out

Phase Title CS-1490: NTH Consultants: As-Needed Geotechnical Services

Phase Total	FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
	0	0	0	0	0	0	0

PHASE **Design** Contract No CS-1490 Phase Status Pending Close-out

Phase Title CS-1490: NTH Consultants: As-Needed Geotechnical Services

Phase Total

CIP Number: **380800**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
0	0	0	0	0	0	0

Phase Tasks and Dates

Phase Category	D	**Design**
Budget	Wastewater	
Phase Status	Pending Close-out	
Contract No	CS-1490	
Cost Est Class		

Phase Category	D	**Design**
Budget	Water	
Phase Status	Pending Close-out	
Contract No	CS-1490	
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	2,441	132							0	2,573
2019	164		0	0	0	0	0	0	0	164

Description of CIP Changes

CIP Number: 380900

Old CIP No.: 1182

Project Title: General Engineering Services

Project Status	Active	☐	Innovation
Budget:	Wastewater	☐	MP Right Sizin
Classification Lvl 1:	Centralized Services	☐	System Reliability
Classification Lvl 2:	Programs		
Classification Lvl 3:	Programs		
Review Committee Project Score:			

Analytical Lab

Project Significance: As needed multi-discipline engineering services for various small scale projects at WTP and WRRF.

Project Engineer/Manager: Beena Chackunkal

Manager: Ali Khraizat

Scope of Work: This project provides for rapid design turn-around for a variety of projects on an as-needed basis providing multi-disciplinary professional services including meter pit improvement services.

Challenges: N/A - Active

Phase Expenses

PHASE **Study and Design and Construction Assistance** Contract No CS-1481 Phase Status Active

Phase Title CS-1481 Sigma General Engineering Services

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
572	916	423	0	0	0	0

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
572	916	423	0	0	0	0

CIP Number: **380900**

Phase Tasks and Dates

Phase Category	S/D/CA	**Study and Design and Construction Assistance**
Budget	Wastewater	
Phase Status	Active	
Contract No	CS-1481	
Cost Est Class		

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018	28	1,250	1,154						0	2,432
2019	138		572	916	423	0	0	0	0	2,049

Description of CIP Changes

CIP Number: **381000**

Old CIP No.: 1343

Project Title: **Energy Management: Electric Metering Improvement Program**

Project Status Future Planned

Budget: Split

Classification Lvl 1: Centralized Services

Classification Lvl 2: Programs

Classification Lvl 3: Programs

Review Committee Project Score:

☐ Innovation

☐ MP Right Sizin

☐ System Reliability

Example of an electric meter

Project Significance: Advanced meters for measuring power usage in real-time to reduce the electrical demands and further optimize load management practices

Project Engineer/Manager: Shaker Manns

Manager: Shaker Manns

Scope of Work: This program will increase the number of electric meters at pumping stations and treatment facilities to allow for active demand management to reduce electricity rates. The meters can be tied to the existing data management system for data archiving and use.

Challenges:

Phase Expenses

PHASE **Study and Design and Construction** Contract No NA Phase Status Future Planned Start

Phase Title Energy Management: Electric Metering Improvement Program

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
500	500	500	500	500	500	0

PHASE **Study and Design and Construction** Contract No NA Phase Status Future Planned Start

Phase Title Energy Management: Electric Metering Improvement Program

Phase Total

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
500	500	500	500	500	500	0

CIP Number: **381000**

FY18-Proj	FY19-Proj	FY20-Proj	FY21-Proj	FY22-Proj	FY23-Proj	FY24 and Beyond
1,000	1,000	1,000	1,000	1,000	1,000	0

Phase Tasks and Dates

Phase Category	S/D/C
Budget	Wastewater
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Study and Design and Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Phase Category	S/D/C
Budget	Water
Phase Status	Future Planned Start
Contract No	NA
Cost Est Class	

Study and Design and Construction

Task Name	Start Date	Duration	End Date
Scope Development			
Procurement			
Project Execution			
Project Closeout			

Total Project Expenses (in $1,000s) Comparison to Prior Year CIP

CIP Version	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
2018		1,000	1,000	1,000	1,000	1,000	1,000		0	6,000
2019	0		1,000	1,000	1,000	1,000	1,000	1,000	0	6,000

Description of CIP Changes

VIII. GLOSSARY

BCE	Business Case Evaluations
BDF	Biosolids Dryer Facility
BFP	Belt Filter Press
BGD	Billion Gallons per Day
CCR	Consumer Confidence Rule
CCTV	Closed-Circuit Television
cfs	cubic feet per second
CIP	Capital Improvement Plan
CMG	GLWA Capital Management Group
COF	Central Offload Facility
CSF	Central Services Facility
CSO	Combined Sewer Overflow
CWA	Clean Water Act
DDOT	Detroit Department of Transportation
DI	Ductile Iron
DRI	Detroit River Interceptor
DRO	Detroit River Outfall
dtpd	dry tons per day
DWRF	Drinking Water Revolving Fund
DWSD	Detroit Water and Sewerage Department
DWSD-R	Specifying the new, Detroiter-focused Detroit Water and Sewerage Department
EPA	United States Environmental Protection Agency
GIS	Geographic Information System
GLWA	Great Lakes Water Authority
GPS	Global Positioning System
HVAC	Heating, Ventilation, and Air Conditioning
I&C	Instrumentation & Controls
IDF	Intermediate Distribution Facilities
IGA	Investment Grade Audit
ILP	Intermediate Lift Pumps
ISD	In System Storage Device
IT	Information Technology
ITS	Information Technology and Services
IWC	Industrial Waste Control
LCR	Lead and Copper Rule
LED	Light-Emitting Diode
LEL	Lower Explosive Limit
LIMS/PIMS	Laboratory Information Management System/Project Information Management System
MACP	Manhole Assessment Certification Program
MBO	Master Bond Ordinance
MCC	Motor Control Centers
MDEQ	Michigan Department of Environmental Quality
MDF	Main Distribution Facilities
MDNRE	Michigan Department of Natural Resources and Environment
MG	Million Gallons
MGD	Million Gallons per Day
NAB	New Administration Building at the WRRF
NASSCO	National Association of Sewer Service Companies
NEC	National Electric Code
NESDS	Northeast Sewerage Disposal System
NIEA	North Interceptor East Arm
NPDES	US EPA National Pollutant Discharge Elimination System
NPL	US EPA National Priorities List
O&M	Operations & Maintenance
OEM	Original Equipment Manufacturer
O-NWI	Oakwood-Northwest Interceptor
OSHA	Occupational Safety and Health Administration
OWI	Oakwood Interceptor

PAC ..... Powdered Activated Carbon
PACP ..... Pipeline Assessment Certification Program
PCCP ..... Pre-Stressed Concrete Cylinder Pipe
PEAS ..... Primary Effluent to Activated Sludge
PLC ..... Programmable Logic Controller
PLD ..... Programmable Logic Device
PRV ..... Pressure Reducing Valve
PS ..... Pump Station
RAS ..... Return Activated Sludge
RTB ..... Retention Treatment Basins
RVSDS ..... Rouge Valley Sewerage Disposal System
RWCS ..... Regional Water Transmission System
SAMO ..... GLWA System Analytics and Meter Operations
SCADA ..... Supervisory Control And Data Acquisition (GLWA uses Ovation brand)
SCC ..... Systems Control Center
SCP ..... Small Capital Projects
SCUBA actuators .. Self-Contained Universal Bi-directional Actuator
SDF ..... Screening and Disinfection Facility
SDWA ..... Safe Drinking Water Act
SFE ..... Secondary Final Effluent
SFP ..... Sludge Feed Pump
SOW ..... Scope of Work
SRP ..... Scheduled Replacement Program
T&O ..... Taste and Odor
TAC ..... Technical Advisory Committee
TCR ..... Total Coliform Rule
TPC ..... Tournament Players Championship Golf Course in Dearborn
VFD ..... Variable Frequency Drive
VR-Gates ..... Valve Remote Gates
WAM ..... Work and Asset Management
WMP ..... Water Master Plan
WMPU ..... Water Master Plan Update
WRRF ..... Water Resource Recovery Facility
WSC ..... West Service Center
WTP ..... Water Treatment Plant
WWTP ..... Wastewater Treatment Plant (old terminology)

IX. APPENDICES

Appendix A ..... Water Business Case Evaluations
Appendix B ..... Sewer Business Case Evaluations
Appendix C..... Centralized Services Business Case Evaluations
Appendix D ..... CIP Request by Funding Source by Year